HIO STATE
NIVERSITY
JUN 20 1961
LIBRARY

Manuscript Received June 3rd, 1961

Price 2s.

RECEIVED
JUN 22
VET. MED. LIBRARY

THE JOURNAL OF THE BRITISH VETERINARY ASSOCIATION

The Veterinary Record

PATRON: HER MAJESTY THE QUEEN

Vol. 73 No. 22 Issue No. 4332 539-562

Registered as a Newspaper

AEI INSTRUMENTATION INFORMATION SERVICE

PORTABLE . . . ROBUST . . . VERSATILE . . .

AEI VETERINARY X-RAY EQUIPMENT

TYPE K5

Packed in convenient carrying case, the K-5 equipment weighs only 56 lbs. yet it will provide excellent radiographs of the entire body structure of small animals. Simple to use, the K-5 will operate from any normal lighting supply. The equipment is completely shockproof, all high voltage parts being hermetically sealed in an oil-insulated container.

Write for full details of the K-5 and other AEI veterinary X-ray equipment to:—
AEI Instrumentation Division,
X-Ray Department,
132 Long Acre, London, W.C.2.

AEI

Instrumentation Division,
Associated Electrical Industries Limited

ALSO X-RAY PROTECTIVE EQUIPMENT · ACCESSORIES AND SUPPLIES

SC/T20

THE VETERINARY RECORD

Founded by William Hunting, F.R.C.V.S., in 1888

Volume 73
No. 22

SATURDAY, JUNE 3rd, 1961

7 Mansfield Street,
London, W.1.
Museum 6541

The William Hunting Awards

In THE VETERINARY RECORD of January 7th, 1956, there was announced the creation of annual awards, bearing the name of the first and greatest editor of this journal, for the best clinical papers published in these pages. The result has been to help attract work of merit, and the recipients of the awards may justly feel that, in return for the honour done them, they have enriched the literature of their profession in just that sector where it tends to be weakest—that of findings recorded in day-to-day practice. But while those who are responsible for the production of THE VETERINARY RECORD find reasonable satisfaction in the results attained, the fact remains that far too few clinical papers are received for publication, having regard to the fact that some 3,000 members of the British Veterinary Association are in private practice.

It is in the hope of persuading more of these members to contribute from the wealth of their experience and knowledge that these words are written.

We may first recall the details of the William Hunting Awards, which are as follows:—

There are two classes: the first for the best clinical paper by an author or authors in private practice, and the second for the best paper by an author or authors in any branch of veterinary work who have been qualified less than five years, provided that the paper is based on clinical material obtained from practical field work and not on experimental material. In addition to the two main prizes, which each take the form of an inscribed silver medal and a cash sum of £25, inscribed bronze medals are awarded to the authors of other papers considered by the judges to be of special merit. The judges themselves are senior members of the profession in full time private practice, and the prizes are given at, or immediately after, each annual congress of the B.V.A.

Of the necessity for clinicians to publish their observations, Hunting himself wrote: "We shall spare no effort in the attempt to extract from practitioners clinical reports of their most interesting and instructive cases. . . . By recording his observations the practitioner adds to the knowledge of his profession." Seventy-two years have passed, but Hunting's words are as apposite as ever they were.

It is hoped, in particular, that younger members of the profession will enter for these awards, which is done automatically by offering work within the limits specified above. The *raison d'être* of the second type of entry was to offer an opportunity to young clinicians who might otherwise be unreasonably penalised by competition with colleages having much longer and more varied experience; and we would urge them to grasp the opportunity in the coming months. To win a prize bearing one of the greatest names in the profession is surely an honour worth seeking?

A reproach sometimes levelled at THE VETERINARY RECORD is that some of its issues are wanting in practical interest for veterinary surgeons in the field; yet where else, except from them, is such material to be found? We ask practitioners to ponder the fact that if five per cent. of their number contributed only one paper a year to these pages it would be possible to publish two or three clinical communications every week. Now that our Association publishes its own research journal—and *Research in Veterinary Science* continues to make gratifying progress—it is more than ever desirable that THE VETERINARY RECORD should reflect the clinical, as well as the experimental work of our members.

A few would-be authors are put off by what they conceive to be the technical difficulties of presenting their work in an acceptable form. This should not be an obstacle. A booklet, *Requests and Suggestions to Contributors*, is available from the editorial office of the B.V.A. on request; and in any case the Editor has available professional help in presenting work which is of value: if the material is there the "trimmings" can soon be added.

Practitioners are busy men and women; but they have a contribution to make to the literature of their profession—and through that literature to future generations of veterinary surgeons—which no one else can supply. It is earnestly to be hoped that they will hear the words of Hunting echoing across the decades—and heed them.

Oedema in Newborn Pigs

BY

B. L. EDWARDS

**Veterinary Investigation Centre,
Ministry of Agriculture, Fisheries and Food,
Worcester**

SUMMARY.—An analysis is presented of the results of the post-mortem examination of 590 piglets of less than 10 days of age. Of these, 479 were born alive, and a firm diagnosis was reached in only 145. Examination of 372 newborn piglets for the presence of subcutaneous oedema revealed 114 as being oedematous in the absence of a definite alternative diagnosis. The overall mortality rate among the litter mates of these pigs was 54.5 per cent. in cases where very oedematous pigs were found, against 33.2 per cent. where specimens were slightly oedematous. A relation is shown to exist between the presence of subcutaneous oedema and lack of milk in the stomach at autopsy. The significance of these findings in relation to the data on neonatal hypoproteinaemia published by other workers, and possible lines of treatment and prophylaxis are discussed.

Introduction

A WATERLOGGED condition of the subcutaneous tissues in aborted stillborn and newborn piglets is probably widely recognised, but there appears to be no published description of the extent and significance of this phenomenon, other than that of Young (1952) who reported a mortality of 80.2 per cent. following a mild virus infection in early pregnancy. McCance and Widdowson (1957) and Rutquist (1958) have reported a low serum protein concentration in apparently normal piglets at birth, which is doubled during the first 2 days of life. The former authors also showed that this rise is largely dependent on ingested colostrum, while the data published by the latter author indicate that the level of albumin present in the serum of newborn piglets is one-fifth of the minimum required to prevent oedema in man. During the course of his examination of stillborn piglets and piglets dying early in life the author was struck by the frequency of oedema as the sole change in such animals. This paper sets out the results of observations made on this phenomenon together with certain conclusions drawn from them.

Materials and Methods

Records of the presence of oedema were not made in the first 126 carcases examined, but for the past 3 years all piglets under 10 days of age have been examined for this feature. The presence and extent of oedema were observed from both the ventral and dorsal aspects of the carcase, after extensive incisions had been made. Slight oedema was recorded where the subcutaneous tissues were perceptibly wetter than normal. In very oedematous cases extensive areas of oedema were found up to 0.5 cm. in thickness. Inocula from standard sites of three-quarters of all the newborn specimens were sown onto 5 per cent. sheep blood agar and MacConkey agar plates, which were then incubated for 24 hours at 37° F. Bacteriological examination was not carried out in the other specimens, either because the diagnosis was of severe trauma or a congenital abnormality, or because the specimens concerned were members of a group, others of which were cultured. Biological tests for the enterotoxin of *Clostridium welchii* type C, and gel-precipitin tests of gut contents set up against the sera of *Clostridium welchii* types A-D were carried out only where the history and morbid anatomical findings justified them.

Protein determinations were made on the serum from 0.5 ml. of clotted blood taken from a small incision in the ear. The method used was based on that of van Slyke, Hiller, Phillips, Hamilton, Dole, Archibald and Eder (1950), and the result read off direct from a conversion table (Edwards, 1959). The latter table is based on a formula devised by van Slyke, Hiller, Phillips, Hamilton, Doyle, Archibald and Eder (1950), and the constants used are appropriate to the concentration of inorganic constituents in porcine sera generally, and to the albumin-globulin ratio in newborn pigs in particular.

Results

Serum protein tests have been carried out on 15 live piglets of less than 10 days of age. In 6 of these dehydration was not a complicating factor and the results are recorded in Table I. The first 3 results illustrate the fact that newborn pigs have a very low serum protein level, while the second 3 illustrate the rise in serum protein level in the first 2 days of life, shown, by McCance and Widdowson (1957), to follow the ingestion of colostrum.

TABLE I
HYPOPROTEINAEMIA IN NEWBORN PIGS

Age	Abnormality	Serum protein in grams per 100 ml. (estimated by S.G.)	Comment
Newborn	Congenital defect	3·3	Hypoproteinaemia
24 hr.	" "	2·9	"
24 hr.	" "	2·9	"
48 hr.	Atresia ani	6·0	Normal serum protein level
72 hr.	Surplus from large litter	5·6	" "
72 hr.	Iso-immunisation	5·2	" "

TABLE II
RESULTS OF THE AUTOPSY OF 590 PIGLETS UP TO 10 DAYS OF AGE

	Total	S/C oedema	No oedema	Per cent. of total	Per cent. of oedematous	Per cent. of not oedematous
Stillborn and aborted	111					
Pigs born alive						
Firm diagnosis	145	66	31	30·3	21·6	46·3
Tentative diagnosis	193	125	28	40·3	41·0	41·8
No diagnosis	141	114	8	29·4	37·4	11·9
Provisional diagnosis and no diagnosis	334	239				
Provisional diagnosis and no diagnosis, empty stomach ...		116				
Provisional diagnosis and no diagnosis, full stomach ...		123				
Total examined	479	305	67			
Total examined for oedema		372				

The results of the *post-mortem* examination of 590 aborted, stillborn and newborn piglets are arranged in Table II from which it may be seen that in those born alive the cause of death was unknown or tentative in 334 or 69.7 per cent. of the total. 372 of the newborn pigs were examined for the presence of subcutaneous oedema and of these 239 revealed oedema in the absence of a firm diagnosis.

Of all the specimens examined 30.3 per cent. revealed a firm cause for death, there being 43 cases of severe trauma, 21 of congenital abnormalities, 64 of pathogenic bacterial infection and 17 of miscellaneous conditions. It is striking that the incidence of these firm diagnoses was only 21.6 per cent. in those piglets revealing oedema but 46.3 per cent. in those having no oedema. The incidence of tentative diagnoses is not influenced by the presence or absence of oedema, but 29.4 per cent. of the oedematous cases were otherwise undiagnosed as compared with 11.9 per cent. of those with no oedema.

TABLE III
RELATION OF SUBCUTANEOUS OEDEMA TO AGE

	Still-born	Age in days at death					
		0	1	2	3	4	5–10
Very oedematous	84	17	11	22	16	3	2
Oedematous		36	32	17	16	2	5
Slightly oedematous		8	34	34	18	10	6
Total observed for Oedema	84	63	82	83	69	23	36
% Oedematous of those observed	100	96·8	93·9	87·9	72·5	65·2	36·6

In Table III the piglets examined for the presence of oedema are arranged according to age. A decline may be seen both in mortality and incidence of oedema as the age of the piglets increases.

The observation that the degree of subcutaneous oedema is of pathological significance is supported by a determination of the levels of mortality in the litter mates of the pigs examined. In Table IV it may be seen that in litters containing very oedematous pigs the mortality was 54.5 per cent., whereas in the case of slightly oedematous pigs it was 33.2 per cent. The average litter size is also rather larger in the case of very oedematous pigs than those slightly affected. Piglets in large litters would be expected to be more likely to starve than those in smaller litters.

TABLE IV
RELATION OF DEGREE OF OEDEMA TO MORTALITY RATE

Degree of oedema	No. of dead	No. born	No. of litters	Per cent. mortality	Av. no. in litter at birth
Severe	226	415	36	54·5	11·5
Moderate	387	940	82	41·2	11·5
Slight	141	425	39	33·2	10·9

Table V partially unmasks the relation between gastric repletion and the absence of oedema because only 5.3 per cent. of those pigs with empty stomachs against 35 per cent. of those with full stomachs were

TABLE V
RELATION OF SUBCUTANEOUS OEDEMA TO STARVATION

	Subcutaneous oedema	No oedema	Per cent. free of oedema
Traces of milk or none	167	9	5·3
More than half full	102	55	35·0

free of oedema. One would not expect the degree of gastric repletion to be correlated with the degree of oedema in every case, because in some piglets starvation might occur after sufficient osmotically active protein had been ingested, and in others starvation in the first day or two of life might be followed by a period when the piglet obtained some milk. Furthermore, dehydration superimposed on hypoproteinaemia might mask the appearance of oedema. Nevertheless this evidence indicates that these variables are dominated by the relation between ingestion of colostral whey-protein and the absence of oedema. In 116 of the 239 cases where oedema was found in the absence of a firm diagnosis the stomach was empty and hypoglycaemia might have been diagnosed, but, of the other 123 where milk was found in the stomach at autopsy, 87 were more than 2 days old. In these cases the intake of colostrum may have been deficient, the stomach

being filled with milk after the phase of intestinal permeability had passed.

Discussion

The evidence presented here integrated with published information relevant to various aspects of the problem appears to be sufficient to form a working hypothesis. As indicated in Table I the newborn pig has a very low serum protein level which is corrected usually by two days of age. This is paralleled by the incidence of oedema, although it appears to continue for a day or two after what is accepted to be the termination of the phase of intestinal permeability (Table III). Some explanation of this lag is provided below in the sections on α-globulin compensation, energy requirements to provide for active secretion of fluid back into the bloodstream, and circulatory adjustments. The failure of one or more of these possible compensatory mechanisms may be the actual cause of death in many cases. Table V supplies strong confirmation of the relation between oedema and starvation but the occurrence of 123 oedematous cases where the stomach was full at death rules out the diagnosis of uncomplicated hypoglycaemia.

The fact that the mortality rate among litter mates is more than 50 per cent. greater in very oedematous pigs than slightly oedematous ones (Table IV) emphasises the contention that oedema is a significant lesion. The larger average litter size is suggestive of a condition aggravated by more intense competition.

Members of the V.I. Service (Anon, 1959) showed that the mortality rate in the age group from birth to 7 days was 15.4 per cent. and that much of this was associated with physical developmental and unknown factors. In the present analysis 114 pigs with no diagnosis other than oedema (Table II) would indicate in the pig population a minimum overall mortality from this condition of 4.7 per cent. If those with a tentative diagnosis were included the figure would be 12.1 per cent. of all pigs born alive.

Betts, Lamont and Littlewort (1950) showed that the heavy mortality, usually resulting from the deprivation of colostrum, may be reduced very considerably when piglets, delivered by caesarean section, are carefully insulated from mechanical, thermal and microbial disturbance. However, a hard core of 6.6 per cent. mortality remained and the possibility of a microbial origin for this was excluded. Lecce and Matrone (1960) present considerable evidence that the ill effects of the deprivation of colostrum are not due principally to the resulting deficiency of γ-globulin and antibodies.

The naturally reared piglet achieves a mature electrophoretic pattern at a few days of age, while in artificially reared piglets this is delayed for several weeks. That this mature pattern is derived from colostrum is supported by the fact that the volume of colostrum ingested, during the phase of intestinal permeability to proteins, contains more than 10 grammes of albumin which is enough to provide for the circulation of a piglet of 3 weeks of age. It is thus possible that slightly modified albumin is stored by the liver of piglets, to be released into the bloodstream as growth proceeds.

The survival of the piglet *in utero* and until the serum-protein-level is raised calls for considerable explanation, because according to Starling (1895) the exchange of fluid between the blood and the tissues is determined in the outward direction by an excess of arteriolar capillary blood pressure over the colloid osmotic pressure of the plasma, and in the inward direction by the reverse of these mechanical forces. Where the concentration and consequent colloid osmotic pressure of the plasma proteins is reduced, as in kwashiorkor or nephrosis in man peripheral oedema results. Hence it is important to consider by what means the surviving piglet may counter the stagnation of fluid in the tissues, until the plasma protein concentration reaches safety-level.

A remarkable feature of the data published by Rutquist (1958) and Lecce and Matrone (1960) is the high level of α-globulin-like material in the serum of newborn pigs. The osmotic activity of this material is unknown but the apparent inverse relationship of its concentration to that of albumin suggests that it may have some substitutive function for albumin *in utero* and in the first few days of life. An automatic decline of α-globulin in the absence of exogenous albumin to replace it might account for oedema and mortality in newborn pigs deprived of colostrum.

The major signs of ill-health seen in most dying piglets are fading and scouring. Fading one would expect from the depression of tissue exchange resulting in oedema, and it is possible that scouring occurs when the osmotic pressure of intestinal contents is greater than the osmotic pressure of the bloodstream. As the piglet becomes moribund the intestinal mucosa would become less able to resist this gradient resulting in loss of fluid into the intestine. In this and other respects the correlation of availability to the piglet between sugar and colostral albumin might be further complicated by some interrelation of function, because the processes, which enable the piglet to maintain tissue exchange while the osmotic gradient is in its state of post-natal transition, might be highly dependent on available energy. On the other hand, while the signs of hypoglycaemia as determined in experiments on pigs using insulin (Sampson & Graham, 1943) are not as frequent as one would expect from the incidence of empty stomachs *post mortem*, it is possible that this is due in many cases to superimposed circulatory stagnation producing oedema.

It is possible that the arterial blood pressure is rather depressed in the newborn piglet, as is the case in the newborn baby, but venous pressure would need to be reduced nearly to zero before the osmotic pressure associated with 2.5 g. per 100 ml. of serum protein had any useful effect on the transfer of fluid from the tissues to the bloodstream. Furthermore, an adjustment in this direction, while it might make some contribution to post-natal adaptation, would render the piglet very susceptible to thermal and mechanical disturbance. Excessive cold with vasodilatation in the internal organs might raise

venous pressure to the point where it caused stagnation of fluid in the tissues. On the other hand, the muscular inactivity associated with adequate warmth, in reducing venous and lymphatic return, might be as harmful, under some conditions, as the shivering and huddling associated with lower temperatures. In practice, however, low temperatures would appear to be the more common predisposing factor of mortality.

Done (1955) has described the advantages to colostrum-deprived piglets in supplementing the cow's milk in their diet with porcine serum, and attributed this effect principally to the protective value of the antibodies present. At that time there was no information available on the albumin-globulin ratio in the serum of piglets at birth, and it seems very likely that a considerable part of the benefit accrued from the albumin present in the serum used. In view of this, exceptional losses might be controlled by dosing newborn piglets with 2 tablespoonfuls of a mixture of dried milk reconstituted with porcine serum 3 times during the first day of life. As a general measure the piglets on the hindmost teats might be selected for this prophylaxis, but where agalactia is present in the sow all the piglets might be treated with advantage.

However, in the long term the basic causes of this condition require investigation, because, while other species including man have serum protein levels depressed at birth, in none is the deficiency so profound as in the pig. It may be a consequence of multiparity associated with immaturity at birth, but the possibilities of genetic accentuation and control require examination. On the other hand, the ideal conditions of nutrition and management for sows approaching parturition are unknown. It is possible that the practice of light feeding in the last week of pregnancy with the intention of preventing mastitis, sacrifices the secretion of colostral albumin. In addition, views regarding the quantity of meal to be fed to pregnant sows and gilts vary by as much as 50 per cent. depending on the source. The practical solution may prove to be the breeding of sows with sufficient "genetic leeway" to utilise a high plane of nutrition without the risk of mastitis, and to rear a high percentage of piglets born.

Acknowledgments.—I wish to thank Mr. L. E. Hughes, S.V.I.O., for advice in the preparation of this paper, and those members of the A.V.T. & R.W. who contributed to a discussion in March, 1960.

References

ANON. (1959). *Vet. Rec.* **71.** 777.
BETTS, A. O., LAMONT, P. H., & LITTLEWORT, M. C. G. (1960). *Ibid.* **72.** 461.
DONE, J. T. (1955). *Ibid.* **67.** 623.
EDWARDS, B. L. (1959). *J. Comp. Path.* **69.** 281.
LECCE, J. G., & MATRONE, G. (1960). *J. Nutrit.* **70.** 13.
MCCANCE, R. A., & WIDDOWSON, E. (1957). *Lancet.* **2.** 585.
RUTQUIST, L. (1958). *Amer. J. Vet. Res.* **19.** 25.
SAMPSON, J., & GRAHAM, R. (1943). *J. Amer. Vet. Med. Ass.* **102.** 176.
VAN SLYKE, D. D., HILLER, PHILLIPS, R. A., HAMILTON, P. B., DOLE, V. P., ARCHIBALD, R. M., & EDER, H. A. (1950). *J. Biol. Chem.* **183.** 331.
STARLING, E. H. (1895). *J. Physiol.* **19.** 312.
YOUNG, G. A. (1952). *J. Amer. Vet. Med. Ass.* **121.** 394.

The Occurence of Scrapie Disease in Sheep of the Remote Himalayan Foothills

BY

I. ZLOTNIK

Moredun Research Institute, Gilmerton, Edinburgh

AND

R. D. KATIYAR

Central Sheep and Wool Research Station, Pashulok, Rishikesh, India

SUMMARY.—Scrapie has been diagnosed both clinically and pathologically in mountain sheep of the Kumaon foothills of the Himalayas. The disease has been known in the area for less than 20 years. The incidence of scrapie varies in different flocks from 1 to 10 per cent. The clinical symptoms and the histopathological changes in the brain stem and the cerebellum have been found to be identical with those observed in scrapie sheep in this country.

Introduction

ABOUT 20 years ago a hitherto unknown fatal disease, associated with persistent rubbing, appeared amongst the mountain sheep of the Tons and Gangotri valleys in the Kumaon hills on the Indo-Tibetan borders. The area forms part of the Himalayan mountains and is situated between 1,000 and 13,000 feet above sea level. The affected districts are not easily accessible as they are situated about 80 to 150 miles from the nearest rail terminals of Dehradun, Rishikesh and Haldwani. Although part of the route from the rail heads can be negotiated by bus, the remainder of the 30 to 80 miles must be done on foot or on horse-back. The sheep population consists of about 700,000 animals of a nondescript mountain breed. They are as a rule white with a slightly Roman nose, short tail and of medium size weighing about 60 to 70 lb. each. The rams have horns, but the ewes are mainly hornless, or have short stumps only, and wool yield is 2 to 3 lb. Community grazing is practised very widely and the size of the individual flocks varies considerably from 50 to 1,000 sheep. During the summer these animals are usually kept on high mountain pastures of 11,000 to 13,000 feet above sea level, but are brought down to 1,000 to 2,000 feet for the winter months.

Psoroptic mange, called "Lodho" by the local farmers of the Tons valley, has been known for many years in the Kumaon hills. The prevalence of mange, however, did not prevent the farmers from noticing a new condition associated with vigorous rubbing which they called "Khujali" in the Tons valley and "Mukoo" in the Gangotri, in each case the meaning being scratching. Not only could the shepherds distinguish between the symptoms of mange and those of the scratching disease, but they knew how to treat mange and were aware that no cure existed for the scratching condition

which terminated invariably in death. There seems to be a general consensus of opinion that the disease has been completely unknown in the Himalayan foothills and that it appeared only after the introduction about 20 years ago of a number of Rambouillet rams into the valleys of Tons and Gangotri. These rams were imported by the late Raja Saheb of Tehri and distributed amongst the farmers in order to improve their stock. The disease has spread to 33 villages and the incidence varies in different flocks from 1 per cent. to 10 per cent. It is important to note that scrapie in its classical form has been unknown in India and so far no cases of the disease in lowland sheep have been reported.

Symptoms

Most of the affected animals are between 1 to 3 years old and both sexes are equally susceptible to the disease.

The first symptoms usually observed consist of a distinct change of behaviour. The affected sheep stamp their feet, scratch their heads with their hind legs and nibble their flanks and legs. The eyes soon assume an anxious look and the animals grind their teeth and continually rub against poles, trees and walls. Constant itching and rubbing soon results in large areas of skin becoming denuded of wool. In the perianal region, at the base of the ears and at the sides of the body the rubbed skin becomes thick and is frequently covered by scab formation. The affected sheep lose weight progressively and finally go down. In some animals only twitching of the head and neck muscles is visible. As a rule rise in body temperature, inco-ordination of gait and loss of appetite is absent throughout the course of the disease.

Pathology

Post-mortem examination of a number of affected sheep did not reveal any naked-eye lesions except damage to the skin due to persistent rubbing. In view, however, of the similarity of the clinical symptoms to those of scrapie, parts of the brain and spinal cord taken from 7 affected sheep which had been kept under observation for several months in the Government Research Station at Uttarkashi (Naitwar district) were fixed in 10 per cent. formol-saline and sent to the Moredun Institute for diagnostic purposes. Unfortunately, material from only 4 of these sheep was suitable for histological examination and the results described below are based on lesions observed in these 4 animals.

Examination of sections from many parts of the central nervous system revealed pathological changes in the grey matter. The observed lesions consisted of widespread neurone degeneration, including simple and multiple vacuolation, chromatolysis, sclerosis, pyknosis and necrosis. Many of the vacuoles, both single and multiple, contained masses of eosinophilic material or discrete round bodies (Figs. 1 and 2).

Although the most striking changes were observed in the medulla, other parts of the brain stem, the spinal cord and the cerebellum were also affected. The distribution of the neuronal lesions varied to some extent in the 4 animals; the following areas, however, were invariably damaged:—

Spinal cord. Vacuolation and necrosis of neurones was confined to the grey commissure.

Medulla. Pyknosis and sclerosis of neurones was widespread, but chromatolysis was present only in the vestibular nuclei, reticular formation and in the raphé. Vacuolation of neurones and to a lesser extent necrosis was invariably present in the nuclei of the raphé, formatio reticularis alba, arcuate nuclei, cuneate and lateral cuneate (Figs. 1 to 5). The number of vacuoles per section of the medulla varied considerably in serial sections, but in no case was the number less than 17 vacuoles.

Pons. The neurones of the vestibular nuclei and those of the spinal trigeminal were pyknotic and vacuolated, the vacuoles being in the form of clusters of small cavities (Fig. 6).

Mesencephalon. In the red nucleus some of the large neurones were invariably chromatolytic and occasionally necrotic (Fig. 7). Vacuolation in the mid-brain was restricted to the nucleus of the inferior colliculus.

Diencephalon. Vacuolated, pyknotic and sclerotic neurones were readily found in the mammillary body and in the medial thalamus.

Telencephalon. Pyknotic and necrotic cells were present in the lenticular nucleus.

Cerebellum. Focal lesions were present in the paraflocculus in the form of degeneration, vacuolation and necrosis of Purkinje cells, accompanied by a decrease in the number of the granule cells (Fig. 8).

Discussion

It appears that in spite of the apparent absence of inco-ordination in the scratching disease of the Himalayan mountain sheep, other clinical symptoms are similar to those of scrapie (Palmer, 1957). However, the histological lesions in the central nervous system of affected animals are identical with those described for natural scrapie in sheep in Britain (Zlotnik, 1958, 1960; Wight, 1960).

The occurrence of scrapie in mountain sheep in a remote and isolated part of Northern India is unexpected in view of the assurance that scrapie is unknown in other parts of the subcontinent. It is possible of course that scrapie is prevalent in India in a form different from that known in this country (as in the case of Rida in Iceland where no rubbing is known to occur (Palsson & Sigurdsson, 1958)), and that this form may have been present for a long time undiagnosed. On the other hand, scrapie may not have been present in the Himalayan sheep until it was introduced in some way by the Rambouillet rams imported about 20 years ago.

Acknowledgments.—We wish to thank Mr. J. C. Rennie for his technical assistance and Mr. D. Watson for preparing the microphotographs.

References

PALMER, A. C. (1957). *Vet. Rec.* **69.** 1,318.
PALSSON, P. A., & SIGURDSSON, B. (1958). 8th Scand. vet. Congress. Sec. A., p. 8.
WIGHT, P. A. L. (1960). *J. comp. Path.* **70.** 70.
ZLOTNIK, I. (1958). *Ibid.* **68.** 148.
———. (1960). *Nature.* **185.** 785.

I. ZLOTNIK & R. D. KATIYAR.—THE OCCURRENCE OF SCRAPIE DISEASE IN SHEEP OF THE REMOTE HIMALAYAN FOOTHILLS

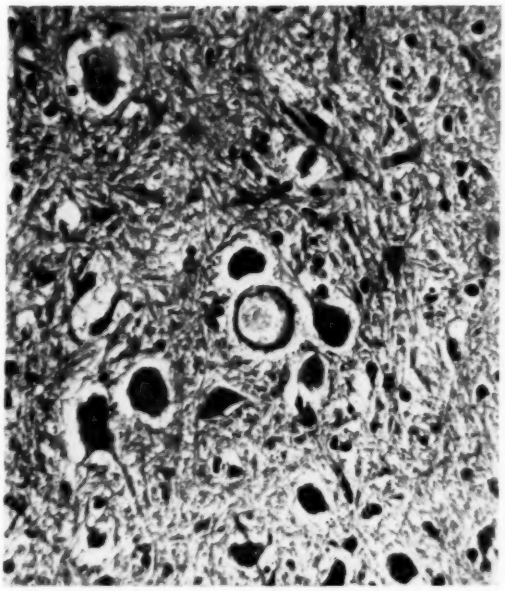


FIG. 1.—Vacuolation and pyknosis in the formatio reticularis alba of the medulla. × 340.

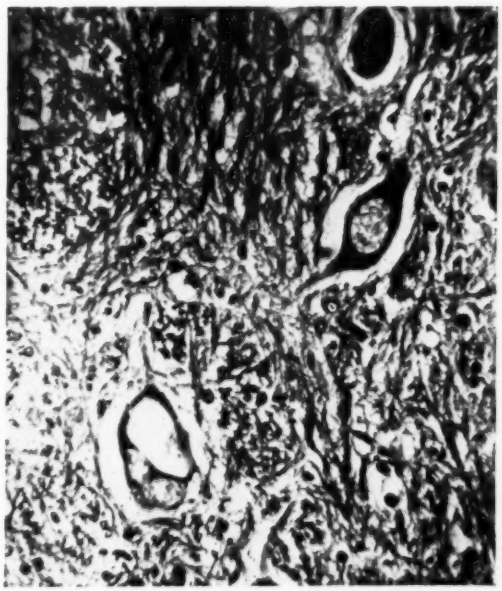


FIG. 2.—Vacuolation in the nucleus of the raphé of the medulla (note eosinophilic material inside the vacuoles). × 340.

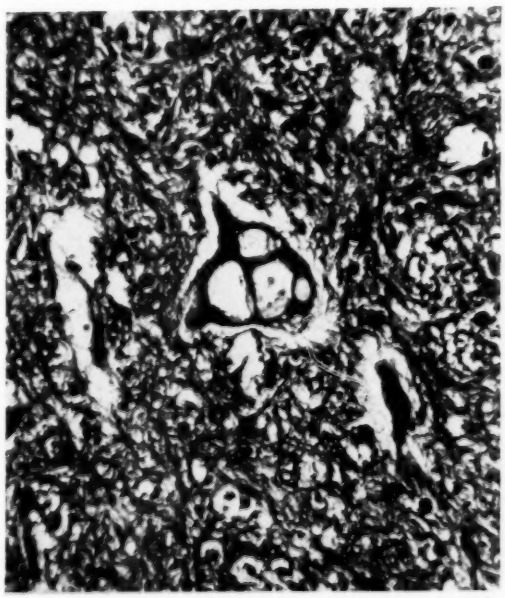


FIG. 3.—Multiple vacuole in the reticular formation of the medulla. × 340.

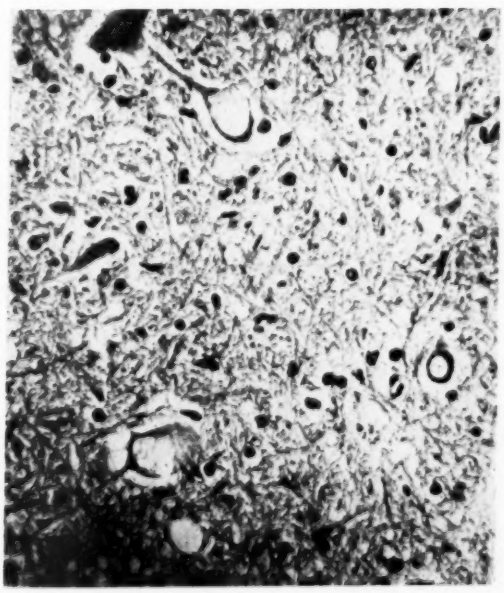


FIG. 4.—Widespread vacuolation in the cuneate nucleus of the medulla. × 340.

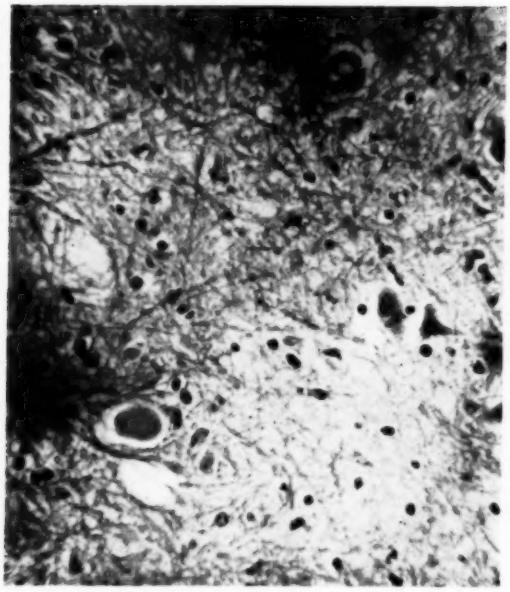


FIG. 5.—Vacuolation and necrosis in the lateral cuneate nucleus of the medulla. × 340.

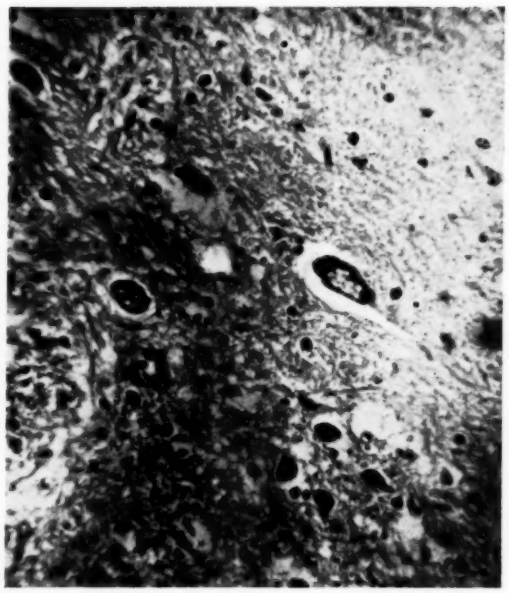


FIG. 6.—Vacuolated and pyknotic cells in the lateral vestibular nucleus of the pons. × 340.

FIG. 7.—Chromatolysis in the red nucleus of the mesencephalon. × 520.

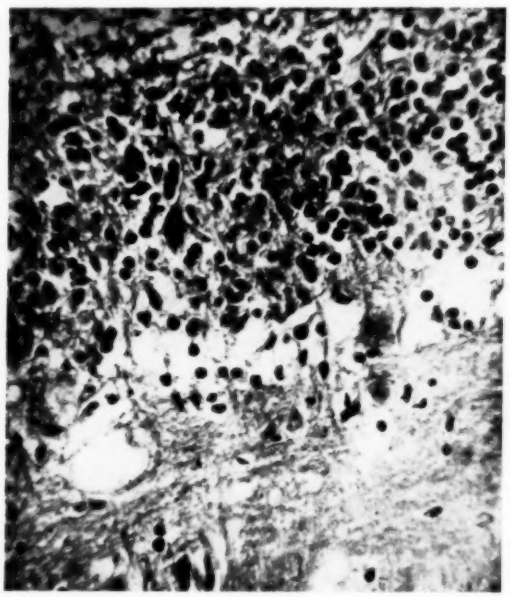


FIG. 8.—Degeneration of Purkinje cells of the cerebellum. × 340.

A Simple Apparatus for Inhalation Anaesthesia in Adult Cattle and Horses

BY

W. D. TAVERNOR

Department of Surgery, Royal Veterinary College
Field Station, North Mimms, Hatfield, Hertfordshire.

Introduction

THERE would appear to be an increasing need for a suitable simple apparatus for maintaining inhalation anaesthesia in large animals by the veterinary surgeon in practice. Although the indications in horses and cattle are limited, there are without doubt many occasions when general anaesthesia would have distinct advantages. The main criteria of any apparatus would appear to be portability, ease of operation and cost.

Various methods and types of apparatus have been described: Lodiudice and Aranes (1946); Gregory (1947); Jones, E. W. (1950); Dyce, Jones and Wadsworth (1952); Oberst (1955); Reed, Allen, Glasser and Keefe (1957); Fisher and Jennings (1957, 1958); Weaver (1960); but they do not necessarily meet these requirements.

Experience suggests that the best volatile anaesthetic agent is halothane. It is potent enough to maintain anaesthesia; easily administered; non-explosive; and if used in a closed circuit is relatively inexpensive.

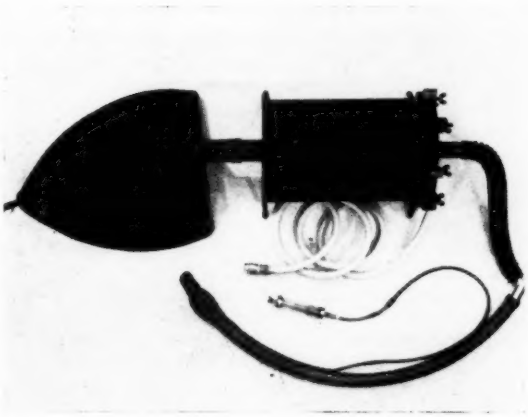


FIG. 1.—Closed circuit apparatus and endotracheal tube.

Apparatus

The simplest type of closed circuit is of the "to and fro" type, in which the anaesthetic gases pass backwards and forwards through a canister containing soda lime. Such a circuit and the details of the absorber are shown in Figs. 1 and 2.

The absorber illustrated is made of brass with a lid secured by clamps, but a tin can of appropriate size is cheaper and provides the same service. The canister will hold up to 9 lb. of soda lime and an expansion chamber at each end ensures the use of all the soda lime and not just that part in the centre of the canister. The soda lime is kept tightly in place by moveable mesh grills and a set of springs. A Heidbrink expiratory valve is fitted into the lid.

Suitable cuffed endotracheal tubes can be obtained in sizes ranging from $\frac{5}{8}$ to 1 inch external diameter and 24 to 30 inches in length. These sizes will meet the requirements of most adult horses and cattle. The endotracheal tube is connected to the

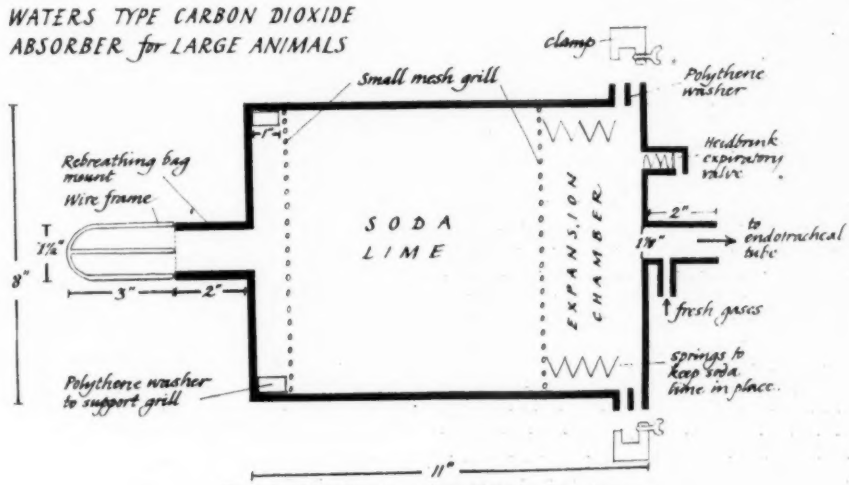


FIG. 2.—Details of carbon dioxide absorber.

absorber by a 12-inch length of standard corrugated tubing and a suitable adaptor (Fig. 3). A mount of 1¼ inch diameter is used to take rebreathing bags of 6 and 8 gallon capacity. These are obtainable on special order from British Oxygen Gases Ltd. and are adequate for most large animals.

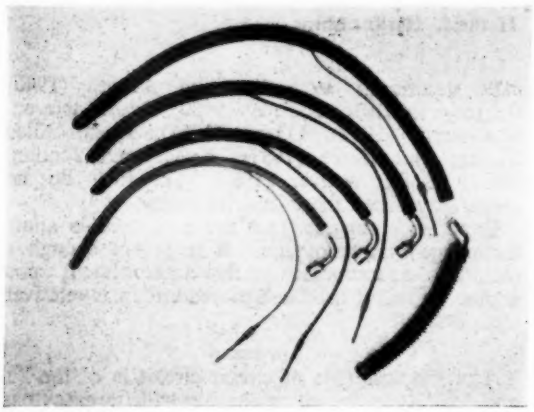


FIG. 3.—Different sizes of endotracheal tubes showing the method of attachment to the absorber.

Fresh gases are supplied to the circuit *via* ¼-inch pressure tubing and enter the absorber at the endotracheal end. The only apparatus required for the supply of gases is a 24 or 48 cu.ft. oxygen cylinder, fitted with a pressure reducing valve, a flow meter and a suitable halothane vaporising bottle. It is also convenient to fit a Boyles Ether Bottle into the circuit to enable the rapid vaporisation of halothane. This apparatus is shown in Fig. 4. The items may be carried separately and connected by tubing, or more conveniently mounted in the simple trolley that is familiar to most veterinary surgeons. A larger Boyles Apparatus can be used but its portability is limited.

The only other special equipment required is a 50 ml. syringe for the induction of anaesthesia with thiopentone and a simple non-return valve to keep the cuff of the tube inflated.

Method of Use

The most satisfactory method of induction is by the intravenous injection of thiopentone sodium. This can be given to the patient standing or recumbent, and in adult horses and cattle a suitable dose rate is 1 gm. per 200 lb. bodyweight. Premedication with atropine sulphate (1/6 to ½ grain in adult animals) some 30 to 40 minutes prior to induction controls to some extent salivation and bronchial secretions. If a sedative agent is used in addition, the recovery time may be somewhat prolonged, which can be a distinct disadvantage in the horse.

Administration of the thiopentone produces recumbency within 30 to 40 seconds when hobbles may be applied if desired Intubation may be facilitated with the aid of a suitable mouth gag, but the latter is not essential. There may be a short period of apnoea, which can be controlled by artificial respiration once intubation is complete.

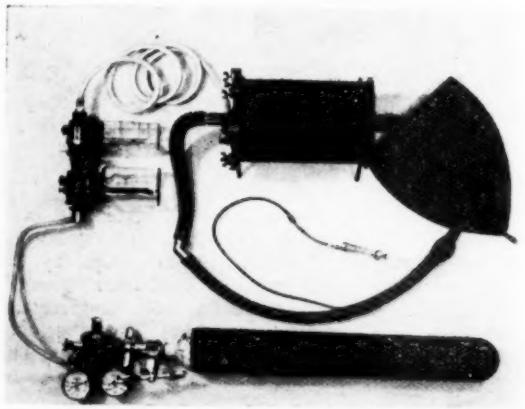


FIG. 4.– Closed circuit apparatus showing gas supply and vaporising bottles.

It is not difficult to introduce the tube into the trachea. The head is fully extended and the tube is introduced into the pharynx. The procedure is facilitated if the larynx is then fixed with one hand and the tube passed on from the pharynx. If the tube should pass into the oesophagus its position can be determined by palpation. Another method of endotracheal intubation in cattle is described by Messervy and Jones (1956). When intubation has been effected and the cuff inflated, the tube is connected to the anaesthetic circuit.

The absorber will hold up to 9 lb. of soda lime, and this quantity will give sufficient absorption for at least one hours' anaesthesia in a horse of 1,000 lb. bodyweight. In smaller animals the same amount of soda lime will be suitable for longer periods of anaesthesia or alternatively smaller quantities of soda lime may be used. For the convenience of the operator indicating soda lime should be used; this turns from white to purple when exhausted. If it is possible to incorporate a window into the wall of the absorber it would be of help to the operator.

Following induction, intubation and connexion of the circuit, the rebreathing bag is filled with oxygen. The animal can then be assisted through any period of apnoea by either pressure on the rebreathing bag or pressure on the chest wall. Once spontaneous respirations commence, halothane vapour may be introduced to the circuit. If the rebreathing bag is too full the Heidbrink valve is opened and excess gases expelled by pressure.

Initially, halothane may be supplied from the vaporiser at about 1.5 per cent. If higher concentrations are used, there may be some breath holding. The concentration should then be increased slowly to about 5 per cent. in order to bring the concentration in the rebreathing bag to a suitable level to maintain anaesthesia as the effect of the thiopentone wears off. It is most important at this stage to assess the state of the anaesthesia and to add more anaesthetic vapour immediately it is required. The

state of anaesthesia is conveniently assessed by observation of the respiratory rate and the eye reflexes. As anaesthesia lightens the respiratory rate will increase, and the palpebral reflex and nystagmus will reappear. It should be pointed out that once nystagmus appears, the anaesthesia will further lighten very rapidly and the patient may commence to chew the tube. In this event, more anaesthetic vapour must be added very quickly. It is found that using the normal halothane vaporising bottle or the "Fluotec" vaporiser it is difficult to get sufficient anaesthetic vapour into the circuit quickly enough. To get over this difficulty a quantity of liquid halothane may be placed in the Boyles Ether vaporising bottle and the oxygen actually bubbled through the liquid for a short period. The anaesthesia may thus be deepened quite rapidly.

During the first half hour or so there may be periodic lightening of anaesthesia, and more anaesthetic vapour must be added. After this time the anaesthesia will become more stable and very little more vapour will be required. When anaesthetic vapour is being added the flow rate of oxygen may be 3 or 7 litres per minute according to the calibration of the vaporising bottle and the concentration of vapour required. When using the ether vaporising bottle for rapid increases of concentration a flow rate of 4 litres per minute for 30 to 40 seconds is usually sufficient.

During anaesthesia the rebreathing bag will gradually reduce in size unless fresh gases are added, due to the uptake of carbon dioxide by the absorber. The bag should be kept to a constant degree of inflation, say three parts full at the end of expiration. If no further anaesthetic vapours are required this can be achieved by a flow of oxygen by-passing the vaporising bottles, *i.e.* both levers set at the "OFF" position. Alternatively, more oxygen may be added from the emergency oxygen supply if a Boyles machine is used. These flow rates are of course related to the minute volume of the patient but the actual flow rates may be quite arbitrary as long as the rebreathing bag is not over-inflated. Fig. 5 shows the complete apparatus in use.

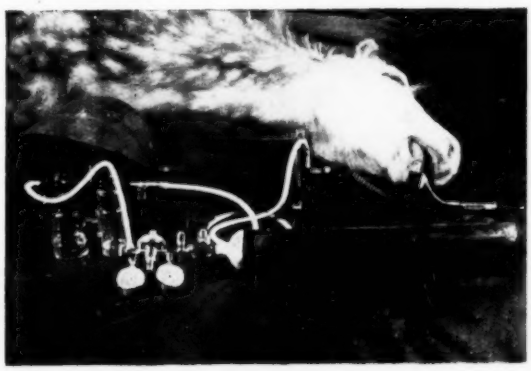


FIG. 5.—Apparatus in use. Halothane in both vaporising bottles.

With this equipment anaesthesia can be maintained in large animals for 2 hours or more without need of any restraint. Post-anaesthetic management varies according to the patient. In cattle the circuit may be disconnected but the endotracheal tube left in place until the swallow reflex returns. The tube is then removed and the animal left propped in ventral recumbency to make a quiet recovery.

Horses on the other hand, should be hobbled and the circuit disconnected. The tube is removed when the swallow reflex returns but the animal is restrained by the hobbles until it is judged that it will be able to stand unaided. This may take 30 to 45 minutes.

Acknowledgment.—The author is indebted to Mr. V. C. Tindley of the Physiology Department of the Royal Veterinary College for making the carbon dioxide absorber.

References

DYCE, K. M., JONES, O. G., & WADSWORTH, F. J. (1952). *Brit. Vet. J.* **108.** 187.
FISHER, E. W., & JENNINGS, S. (1957). *Vet. Rec.* **69.** 769.
———, & ———. (1958). *Ibid.* **70.** 567.
GREGORY, R. A. (1947). *Ibid.* **59.** 377.
JONES, O. G., SCALES, J. T., & WADSWORTH, F. J. (1952). *Ibid.* **64.** 112.
JONES, E. W. (1950). Thesis, Cornell.
LODIUDICE, C. N., & ARANES, G. M. (1946). La Plata, Facultad de Medicina Veterinaria, Universidad Nacionale.
MESSERVY, A., & JONES, E. W. (1956). *Vet. Rec.* **68.** 32.
OBERST, F. H. (1955). Thesis, Cornell.
REED, W. C., ALLEN, C., GLASSER, M. E., & KEEFE, E. R. (1957). *Vet. Med.* **52.** 474.
WEAVER, B. M. Q. (1960). *Vet. Rec.* **72.** 1,121.

AFRICAN SWINE FEVER

European countries have been preparing to cope with any outbreak of African swine fever should it spread beyond the borders of Spain where it has been raging since last year, the European Commission on Agriculture was told recently. The Commission was informed by Dr. N. R. Reid, of FAO's Animal Health Branch, that through the co-operation of the Spanish and the United States governments, a training course on diagnostic methods had been organised in Spain last month by FAO. Three veterinary experts from the United States had participated in the course, which was attended by trainees from 7 countries: Belgium, Denmark, France, the Federal Republic of Germany, Italy, the Netherlands and Switzerland.

These trainees were given a thorough grounding in new tests that would enable them to differentiate African swine fever from the less dangerous European type. The FAO official described the epidemic in Spain as "the greatest threat to the pig industry in Europe that has yet been experienced." As at March, 1961, 35 foci of infection still existed in Spain, spread over 8 provinces. There was no prophylactic vaccination or cure for this fever. Slaughter of pigs infected or in contact with diseased animals was the only method of control.

A Case of Warfarin Poisoning in a Labrador Bitch

BY

J. G. WATT
Department of Surgery

AND

D. L. DOXEY
Department of Medicine, Royal (Dick) School of Veterinary Studies, University of Edinburgh

SUMMARY.—A case of warfarin poisoning in the dog is reported. The method of treatment included exchange transfusion of whole blood and parenteral administration of water-soluble analogues of vitamin K.

The effectiveness of the treatment is discussed and doubt expressed regarding the value of water-soluble analogues of vitamin K in such circumstances.

Case History

A 5-YEAR-OLD Yellow Labrador bitch with a history of continuous good health had eaten a considerable quantity of warfarin-treated bait laid for mice. Six days later the owner noticed that it was rather dull and he administered a dose of liquid paraffin. That afternoon it passed a large quantity of black, evil-smelling, soft faeces, after which it appeared much brighter and took a small quantity of food.

The following day (October 8th, 1960) the dog was very ill and was presented to the local general practitioner who administered an enema following tentative diagnosis of warfarin poisoning. The resultant motion contained a considerable quantity of bone fragments and was freely mixed with blood. All subsequent motions contained blood. The next day the dog was admitted to hospital suffering from acute debility due to blood loss. The hindquarters were blood-stained and it passed blood-stained urine. The temperature was 98.4° F., the pulse was very fast and easily compressed. Respirations were fast and laboured. The mucous membranes were very pale and the dog was moderately dehydrated. On the basis of the clinical picture and history, a diagnosis of warfarin poisoning was made and 30 mg. of synthetic vitamin K* were given by intramuscular injection.

Next morning the dog was in a state of almost total collapse. It could not rise unaided, but could stand although unable to walk without falling. The mucous membranes were very pale and showed some jaundice. The pulse was extremely fast and very weak. Temperature was 100.8° F.; respiration was very fast and laboured. The erythrocyte count at that time was 1,800,000 per c.m.m. (see Table I). Urine was almost black in colour due to the presence of blood and blood products, but of quite good volume. The extremities were all cold to touch. Transfusion was started at 11.15 a.m. using whole blood in acid-citrate dextrose anticoagulant. The clotting time at this stage was in excess of 2 hours using a modified Lee and White technique. At 12.30 p.m. transfusion was stopped, 425 ml. having been administered by drip. The mucosal colour was close to normal except that the jaundice was considerable worse. The ataxia was much improved and the dog could walk fairly steadily. The extremities were fairly warm to touch. It drank a pint of water but refused saline. Half an hour later it drank a further 1½ pints and passed a large volume of strong-smelling, bile-stained urine which contained no visible blood.

Throughout the afternoon the dog was under constant surveillance and a gradual deterioration was noticed. It became progressively paler and the jaundice became more and more obvious. The extremities, however, remained warm.

At 4.30 p.m. the transfusion was started again using a fresh bottle of blood in A.C.D. A short time after this transfusion was started, a needle was inserted into the recurrent tarsal vein and the dog was slowly bled from this needle, the rate of bleeding being controlled to concur with the rate of transfusion.

By 5.30 p.m. 400 ml. of blood had been transfused and 400 ml. removed by the bleeding. A fresh bottle of blood was set up and a further 200 ml. transfused over the next hour. 10 mg. vitamin K analogue was given intramuscularly at the end of this transfusion. The condition of the dog was then roughly comparable with that seen at the end of the morning transfusion except that the jaundice was slightly more noticeable. It drank almost a quart of water and passed a large volume of bile-stained urine. The blood removed by the venepuncture was extremely dark in colour and did not clot after 18 hours. The cellular fraction settled out very rapidly and the plasma was densely yellow in colour.

Two hours later at 8.30 p.m. the clotting time, using the modified Lee and White method, was 6 minutes. The clot was fairly good but showed little retraction. The patient now refused to drink water but this was available to be taken as desired. 5 ml. of 20 per cent. solution of de-specified bovine albumin* were given intravenously.

* "Vikastab" (Boots, Ltd.). Water-soluble analogue of vitamin K. 1 ml. contains the equivalent to 10 mg. of Menaphthone B.P.

* Alboven: C. J. Hewlett & Son, Ltd.

By 11 p.m. the mucosal colour was again deteriorating and the jaundice was still increasing. The dog had managed to drink a further quart of water and passed a large volume of very yellow urine. Transfusion was started once more and bleeding from recurrent tarsal vein was also started again. At this time the body temperature was 101.5° F. and the clotting time was 8 minutes. By midnight 350 ml. of blood had been transfused and 400 ml. removed. The pulse was now nearly normal in rate and condition. Respirations had fallen to 20 per minute and the mucosal colour was nearer normal than at any time since the admission of the animal to hospital. The blood which had been drawn off clotted fairly quickly and the clot was quite a good one. It retracted fairly well, the supernatant serum being very yellow in colour. Following this transfusion the dog drank a little water and took one ounce of protein hydrolysate† quite readily. Urine was passed following drinking, it was of less volume than previously and still heavily bile-stained. The dog was then able to walk down a fairly steep stair to its kennel without sign of undue effort.

The subsequent progress was one of steady recovery. Vitamin K analogue was given daily by deep intramuscular injections for a total of 7 days, the total dose being equivalent to 90 mg. Menaphthone. The jaundice gradually disappeared until it had gone completely by the fifth day in hospital. The accompanying table shows the steady improvement in the haematological picture from just before the first transfusion and during subsequent treatment.

TABLE I

Date	Time	Red cell count per c.m.m.	Clotting time (L & W mod.), in minutes	Temperature in degrees F.	Pulse	Respirations
11.10.60	10.00 a.m.	1,800,000	>120	100·8	Fast and soft	Very fast and laboured
	8.30 p.m.	—	6	—	Firmer but still fast	—
	11.30 p.m.	—	8	101·5	Steadier	20/min. Normal excursion
12.10.60	10.00 a.m.	4,460,000	6	101·8	105/min. Firm	20/min. Normal excursion
13.10.60	10.00 a.m.	4,930,000	4	101·5	98/min. Firm	20/min. Normal excursion
14.10.60	10.00 a.m.	5,150,000	8½	101·8	100/min. Firm	20/min. Normal excursion
15.10.60	10.00 a.m.	—	4	101·6	96/min. Firm	20/min. Normal excursion
19.10.60	10.00 a.m.	5,800,000	4	—	—	—

The bitch was returned home 11 days after admission and was then in moderate health. She was last examined 2 months after her illness and was then in very good condition working occasionally with the gun.

The blood samples removed by massive bleedings were analysed for presence of Dicoumarin products using the method described by Garner (1956) but the results were negative in both cases.

† "Protogest" (Burroughs Wellcome & Co.) Aqueous solution containing 8 per cent. Protein Digest and 10 per cent. Dextrose.

Discussion

Transfusion

In any animal with a red blood cell count of less than 2,000,000 per c.m.m. the transfusion of whole blood must be of value, since any increase in the oxygen-carrying capacity of the circulating blood will immediately alleviate the respiratory distress produced by the attempts to oxygenate the tissues sufficiently. This was the main reason for the first transfusion. Other factors, at least partially, corrected by this transfusion were the diminution in blood volume due to haemorrhage, the high bile-pigment content and the lowered prothrombin content of the plasma.

By later transfusing the dog whilst also removing large volumes of blood from the circulation these improvements were maintained without danger of over-transfusion of the animal with the complications which that would have produced. A pulmonary oedema produced by over-transfusion, superimposed upon dyspnoea due to anoxia would, in all probability, have produced fatal results. The rapid improvement in total red cell values and the decrease in clotting time from infinity to reasonably physiological proportions were ample vindication of this line of treatment.

The bloods used in these transfusions were not cross-matched in any way since previous experience has shown that the simple, direct slide agglutination technique of Young, O'Brien, Swisher, Miller and Yuile (1952) produces so many doubtful or negative reactions, which later prove positive using an indirect method based on the anti-globulin test devised by Coombs, Moorant, and Race (1945), that the only results which can be relied upon from the direct test are the strongly positive agglutinations; a negative reaction being no guarantee that the bloods are in fact compatible. In an emergency such as this case presented there is not sufficient time for carrying out the indirect analysis. Whilst haphazard transfusion of whole blood is to be deplored, it is obviously better to accept the risk of reaction due to transfusion rather than countenance the prospect of almost sure disaster for lack of it. In those circumstances it is a calculated risk which has the odds balanced in

favour of success so far as a first transfusion is concerned. If however, at a later date, a second transfusion is needed there is a very much greater chance of an incompatible reaction occurring (Young *et al.*, 1952).

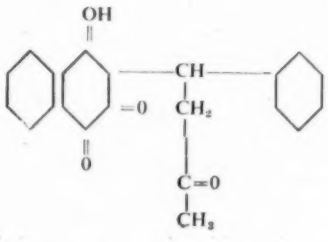
Value of Excessive Fluid in Jaundice

There appears to be no record of warfarin producing jaundice but this case became very severely jaundiced—presumably due to the picking up of degraded haemaglobin from haemorrhage points throughout the tissues of the body. The liver was obviously unable to cope with this amount of material, the excess producing an increase in the plasma bile pigment level to the extent that it was deposited in the tissues. The urine passed by the bitch was very highly coloured with bile and was very evil-smelling. Since this was the case it was felt that one way of decreasing the jaundice was to increase the fluid intake and output, with the effect of removing bile pigment from the animal through the kidneys. The bitch was thus allowed to satisfy her enormous thirst and the latter maintained by giving her a protein hydrolysate solution to drink and also by intravenous injection of de-specied bovine albumin. The protein hydrolysate solution is very concentrated and has a high salt content. As well as increasing thirst it was thought that such treatment would also compensate to some extent the loss of electrolyte due to frequent micturition.

The bovine albumin solution acts as a source of colloid for plasma extension (Harthoorn, 1953). It increases the plasma osmotic tension, acting by drawing fluid from the interstitial tissues into the circulation, by holding water in the circulation after absorption from the bowel or by holding such fluids as Ringer's solution when given intravenously. In this case it was hoped that it would draw fluid loaded with bile from the interstitial tissues, producing some degree of dehydration and also encourage absorption of fluid from the bowel, both of which would produce thirst, and so increase fluid consumption at a time when the bitch was already satiated. It seemed to carry out these functions fairly well as far as could be judged on a clinical basis. Certainly the water consumption increased to a considerable extent when a decreased consumption was to have been expected.

Warfarin:—

Warfarin is a colourless, tasteless and odourless crystalline compound. It is a member of the dicoumarin group of drugs, the parent substance of which



(dicoumarol) was isolated by Campbell and Link (1941) as the aetiological agent in spoiled sweet clover disease in Canadian cattle. It was later purified and synthesised by Stahman, Huebner and Link (1941) and Huebner and Link (1941). Using the purified substance, it was shown that there was a direct relationship between the degree of hypoprothrombinaemia and the amount of the drug administered (Link, 1944).

Derivatives of dicoumarol are widely used in medicine in treatment of thrombosis. Warfarin also serves a more everyday purpose as a rodenticide.

In the early stages of dicoumarin poisoning there is a fall in the blood level of Factor VII and some factor (or factors) affecting the formation of thromboplastin. This is followed by a fall in the prothrombin level which is only seen to any extent in clinical cases of dicoumarin poisoning or over-dosage. In addition there is a reduction in the adhesiveness of platelets, a reduction in the effectiveness of platelet thrombi and some increase in capillary fragility (Wright, 1954; Zucker, 1947).

Weiner, Brodie and Burns (1954) have studied the metabolism of a variety of the dicoumarol drugs and find that the duration of activity depends on the length of time they remain in the bloodstream. Warfarin disappears from the dog's blood at about 4 per cent. per day and the effect on the prothrombin level lags one to two days behind the concentration of the drug (*i.e.* the lowest prothrombin level is seen one or two days after the highest blood level of warfarin) (Weiner *et al.*, 1950).

When given by mouth dicoumarol drugs are slowly and erratically absorbed from the gastro-intestinal tract. Once absorbed, the drugs are gradually metabolised to unknown transformation products (Weiner *et al.*, 1950).

The site of activity of these drugs is believed to be in the liver but there is only presumptive evidence for this belief. Lupton (1947) showed that, in rats, dicoumarol inhibited a rise in prothrombin activity of blood perfused through the liver while there was an increase in this activity in similar perfusions of the livers of untreated control rats. It has also been shown that about 10 per cent. of the dicoumarol becomes fixed in the liver (Lee *et al.*, 1950).

The structural resemblance of dicoumarol to vitamin K led Woolley (1947) to suggest that these drugs act by a competitive interference with vitamin K and replace the vitamin in an enzyme system which is required for the synthesis of the coagulation factors which are found to be deficient in dicoumarin-treated animals. This has never been conclusively proved but some circumstantial evidence has been presented in that administration of vitamin K is able to reverse or prevent the action of these drugs (Douglas & Brown, 1952), and the coagulation defects observed in vitamin K deficiency appear to be the same as those produced by dicoumarin drugs (Douglas, 1955).

Unless they are very large, single doses of warfarin are said to be unable to exert a lethal effect but if repeatedly ingested in small amounts they prove fatal by producing haemorrhage in internal body tissues. In the case discussed only one large amount

was eaten. Dogs can withstand 20 to 50 mg. per kg. bodyweight in single doses but daily doses of about 5 mg. per kg. may produce clinical signs of haemorrhage and even fatal haemorrhage within a week. There is, however, in the dog great variations in toxic level of warfarin (McGirr & Papworth, 1955) and also variation in the same individual at different times (Weiner, Brodie & Burns, 1954).

Vitamin K Therapy in Warfarin Poisoning

In the treatment of the case of warfarin poisoning reported water-soluble analogues of vitamin K were administered by intramuscular injection in an attempt to produce a renewed synthesis of blood coagulation factors, rendered deficient by the ingested warfarin. Subsequent study of the relevant literature shows that this therapy was, if not useless, of only slight value. Garner (1957) recommends this line of treatment and Boddie and Burgess (1953) used it with apparent success.

Jones, Bennett, Scheinberg and Butler (1949) state that water-soluble analogues of vitamin K, given intravenously in large doses, had little effect in shortening the prothrombin time in man after dicoumarol therapy. Miller, Harvey and Finch (1950) came to similar conclusions.

Douglas and Brown (1952) compared the effects of vitamin K_1, Menaphthone B.P., acetomenaphthone and a number of proprietary preparations of water-soluble analogues of vitamin K on the reduction of the prothrombin time in human patients undergoing therapy with the dicoumarin drugs, dicoumarol and Tromexan. They found that, using vitamin K_1 in doses of around 200 to 300 mg., the prothrombin time was restored to normal within 24 hours and had reached safe levels within 6 to 8 hours. The water-soluble analogues produced no appreciable lowering of prothrombin times in the same period irrespective of the size of dose administered. Limitation of dose was the pain caused by the injection. These workers consider that in emergency due to over-dosage of this type of anticoagulant the only effective treatment would be parenteral administration of vitamin K_1 with or without blood transfusion. Toohey (1952) considers that, even in cases where the prothrombin level is as low as 10 per cent. of normal, oral administration of vitamin K_1 in fairly large doses, will result in production of safe prothrombin levels within 8 hours with the first improvement becoming apparent within 4 hours of administration.

It is dangerous to draw parallels in the effects of any substance between one species and another but the pharmacology of the dicoumarin drugs in man and in the dog appear to be so nearly identical that it is fairly reasonable to assume that vitamin K_1 would be far more effective in the treatment of warfarin poisoning in the dog than its water-soluble analogues.

Analytical procedures for detecting the presence of dicoumarin drugs are such that a negative result is inconclusive. Even though there was no warfarin circulating in the blood at the time these tests were carried out, there could have been some in store in the liver. It is probable that, by the time transfusion was started the effects of the poison were decreasing and that, as the normal synthesis of the deficient coagulation factors was renewed, the clotting time would have gradually returned to normal without treatment, provided the animal, which was in a state of collapse, would have survived long enough for this process to occur.

Transfusion of very large quantities of whole blood with normal clotting mechanism increased the total amount of blood coagulation factors circulating in the animal and, by exchange transfusion, this increased level was still further raised to within safe limits.

It is significant that 24 hours after the start of therapy, using the water-soluble analogue of vitamin K, the clotting time was still at virtual infinity and the rapid reduction to within normal physiological limits was entirely concurrent with the progress of the blood transfusion therapy carried out.

That there was no significant decrease in the advantage gained by transfusion during the following few days was probably due to the fact that the renewed production of the deficient factors was sufficient to maintain the safe levels which had been attained. In this, the synthetic process may, or may not, have been assisted to some extent by the water-soluble analogues which were administered.

Conclusions

The treatment of warfarin poisoning in the dog can be materially aided by using massive transfusion of whole blood. In cases where over-transfusion would be required to attain a coagulation time within reasonably safe limits the procedure of exchange transfusion can be used to advantage. It must be borne in mind that, until a reasonably rapid and satisfactory method of cross-matching of blood is available, the transfusion of whole blood is a therapeutic measure which may, in itself, produce further danger to the patient. This factor is even more important in the case of an animal which has been previously submitted to such a transfusion.

Examination of the coagulation time of whole blood is a valuable guide to the effectiveness of the therapy being used.

The administration of water-soluble analogues of vitamin K is of doubtful value in the treatment of warfarin poisoning but the intravenous or oral use of vitamin K_1 would appear to be a very rapid and effective antidote to the poison.

From an economic standpoint vitamin K_1 is approximately 7 times more expensive per unit than is the water-soluble analogues of the vitamin, but since a single, or at the most, two doses would be required in place of 5 to 7 administrations of the analogue the relative cost of therapy is immaterial.

In absence of whole blood, in most cases the administration of vitamin K_1 would be adequate by itself. The morbidity due to extreme anaemia would be considerably reduced if blood transfusion were to be used.

Acknowledgments.—We are indebted to Professor G. F. Boddie and Professor J. S. A. Spreull, in whose

(*Concluded at foot of page overleaf*)

"Go West Young Man"

BY

J. W. BARBER-LOMAX

Having regard to the fact that R.C.V.S. Day is being celebrated this coming week in Edinburgh, it seemed appropriate to publish this article on so notable a Scottish veterinarian as James Macqueen. We are indebted to Mr. Barber-Lomax, whose researches into the history of the profession are of so much value and interest to his colleagues.

JAMES MACQUEEN who will be remembered by many as Professor of Surgery at the Royal Veterinary College, in which capacity he served from 1890 to 1928, spent the whole of his professional life teaching—first at Glasgow Veterinary College and then in Camden Town.

Macqueen qualified as a veterinary surgeon at Glasgow Veterinary College in 1877 and during his student days was awarded one gold and four silver medals. His outstanding progress in College augured well for his future career and was all the more remarkable in view of the limited nature of his early education. At the end of his professional career he recorded that he had never ceased to regret his lack of a sound English education the want of which had, he wrote, restricted his usefulness to the profession. "I have never had sufficient confidence in my scrappy learning to know with certainty when or whether I was speaking or writing correctly. Otherwise I might have done more for the profession with some credit to myself." Those who knew Macqueen will know if with these sentiments he did himself justice.

In 1932, James Macqueen wrote a sketch with some reflections of his early life and how he became a veterinary surgeon. This autobiographical material has not been published previously in this form and, apart from its intrinsic interest to the veterinary historian, is worth recording as an account of the adventures of an emigrant to the U.S.A. nearly a hundred years ago.

Early Days

"I was born on February 14th, 1853, at East Newton, Avondale, Lanarkshire, the third son of a tenant farmer and cattle dealer, who died in 1861, leaving a widow, six children and many unpaid debts. Immediately after his death the crops, livestock and planishing were sold by public roup to satisfy the creditors and, in particular, the landlord, the rent being in arrears. Soon after this event, the children were distributed amongst friends and in 1863 I was sent to Newcastle upon Tyne to a distant relative who had undertaken to keep, educate and prepare me for a useful career.

"I was allowed to run about more or less free, doing odd jobs, messages, etc., and after a year or two I was sent in the evenings to Rye Hill School for private tuition by the Master and his assistant—both Scotsmen and not always strictly sober at night. However, I was saturated with promiscuous, un-

---

A Case of Warfarin Poisoning in a Labrador Bitch. —*Concluded.*

departments this work was carried out, for their valued guidance and advice. We are also grateful to Mr. P. J. Barden, B.V.SC., M.R.C.V.S., for the analysis of samples for warfarin and to Mr. R. Brown for the haematological estimations which they kindly executed on our behalf.

We also thank Mr. C. Renton, M.R.C.V.S., and the owner of the dog for the privilege of examining and treating the animal and for their co-operation throughout the period of treatment.

References

BODDIE, G. F., & BURGESS, J. W. (1953). *Vet. Rec.* **65**. 398.
CAMPBELL, H. A., & LINK, K. P. (1941). *J. Biol. Chem.* **138**. 21.
COOMBS, R. R. A., MOORANT, A. E., & RACE, R. R. (1945). *Lancet.* **ii**. 15.
DOUGLAS, A. S., & BROWN, A. (1952). *Brit. Med. J.* **1**. 412.
———. (1955). *Ibid.* **11**. 39.
GARNER, R. J. (1956). *Nord. Vet. Med.* **8**. 514.
———. (1957). "Veterinary Toxicology." Baillière, Tindall and Cox, Lond.
HARTHOORN, A. M. (1951). "The Therapy of Shock in the Dog." Thesis, Utrecht.
HUEBNER, C. F., & LINK, K. P. (1941). *J. Biol. Chem.* **138**. 529.
JONES, D. F., BENNETT, I. L., SCHEINBERG, P., & BUTLER, J. J. (1949). *Arch. Intern. Med.* **83**. 632.
LEE, C. C., TREVOY, L. W., SPINKS, J. W. T., & JACQUES, L. B. (1950). *Proc. Soc. Exp. Biol. N. Y.* **74**. 151.
LINK, K. P. (1944). *Harvey Lectures.* **39**. 162.
LUPTON, A. M. (1947). *J. Pharmacol.* **89**. 306.
MCGIRR, J. L., & PAPWORTH, D. S. (1955). *Vet. Rec.* **67**. 124.
MILLER, R., HARVEY, W. P., & FINCH, C. A. (1950). *New Eng. J. Med.* **242**. 211.
STAHMAN, M. A., HUEBNER, C. F., & LINK, K. P. (1941). *J. Biol. Chem.* **138**. 513.
TOOHEY, M. (1952). *Brit. Med. J.* **II**. 687.
WEINER, M., BRODIE, B. B., & BURNS, J. J. (1954). Report on Internat. Conference on Thrombosis and Embolism, Basel.
———, SHAPIRO, S., AXELROD, J., COOPER, J. R., & BRODIE, B. B. (1950). *J. Pharmacol.* **99**. 409.
WOOLLEY, D. W. (1947). *Physiol. Rev.* **27**. 308.
WRIGHT, H. P. (1954). Report on Internat. Conference on Thrombosis and Embolism, Basel. P. 181.
YOUNG, L. E., O'BRIEN, W. A., SWISHER, S. N., MILLER, G., & YUILE, C. L. (1952). *Am. J. Vet. Res.* **13**. 207.
ZUCKER, M. B. (1947). *Am. J. Physiol.* **148**. 275.

systematic information which I found very useful in later years.

"At the suggestion of my teachers I joined the Mechanics Institute—the first of its kind in England—where I could attend classes and obtain books from the library.

"About this time (1866) I became a member of the working-men's club (just round the corner from where I lived), a matter of three-pence a week, where the chief London and provincial newspapers were displayed on sloping boards.

A Golden Prospect

"One day when reading a London paper I was captivated by the slogan, frequently repeated by Horace Greely, proprietor and editor of the *New York Tribune*: 'Go West, young man, go West! To the West, to the West, to the land of the free; where the mighty Missouri rolls down to the sea: Where a man is a man if he's willing to toil and the humblest may gather the fruits of the soil.'

"For some time this rang in my ears and in a month or two I saw a notice in a London paper headed: 'To Emigrants to the United States of America.' The terms were very attractive to me. They included pre-emption rights to 160 acres of prairie land and passage by steamship and train to Nebraska, Wyoming, Kansas, Montana or Colorado for £6! This kept me thinking and wondering what my future in Newcastle might be, as so far I had no sure prospects of entering a profession as I had no money and my education was extremely meagre.

"Once, my relative made me an offer to continue to keep, clothe and educate me for a solicitor provided my friends would supply the premium of £100. This I tried to gather and failed completely. One well-to-do uncle in refusing to contribute told me to be careful 'lest my zeal might outrun my discretion.' I could see that I would have to go into the public-house business in the employ of my relative or clear out of Newcastle.

"While running about Newcastle I received my first incentive to become a veterinary surgeon on seeing the late Clement Stephenson in regimentals and mounted as the Veterinary Officer to the Northumberland Yeomanry. I followed him everywhere during the training of the Yeomanry and I resolved to qualify if possible as a V.S. I did not know how to go about this at that time. My chief difficulty was the want of money and to earn some I decided to try my luck in the States.

To the New World

"I left Newcastle and went to Birmingham to stay with friends for a few weeks hoping to raise enough money to enable me to go to America as an emigrant. I managed to collect £10.

"I then bought an emigrant's ticket from the agents, Reed & Keen of London, and sailed from Liverpool in *S.S. Austrian*, bound Baltimore, then onward by train to Denver, Colorado.

"On the way, the ship called at St. Johns, Newfoundland; St. Johns, Nova Scotia; Norfolk, Virginia; and finally—sailing up Chesapeake Bay—landed her passengers at Baltimore, Maryland, where, alongside the wharf, an emigrant train was waiting.

"In those days, trains carrying only emigrants were frequently shunted to allow fast trains to proceed and they were pulled up three times a day at wayside stations for 'good square meals' for the emigrants who paid for what they consumed and this outlay very soon depleted my store of cash.

"Eventually I reached Denver, on the 19th day out from Liverpool, and immediately proceeded to the office of the Emigration Agents as I had no letters of introduction, nowhere to go and only six dollars in my pocket. But I firmly believed that a healthy youth who was able and willing to work would not be allowed to starve in a New Country.

"Anyhow, employment of a sort was urgent. The agents asked me many questions about what I could do, sheepshearing, digging irrigation ditches, mining, etc., and finally advised me to move on to Black Hawk—a mining village about 40 miles up the Rocky Mountains—where an Englishman was boring a tunnel from East to West through the mountains.

The Mining Camp

"I moved on, saw the Englishman, Colonel H., early next morning. He was in bed, rather picturesque, Spanish looking and quite friendly though inclined to curse me for venturing so far from home.

"He gave me directions where I might find work as a labourer, etc., finally telling me that, should I fail in finding a job, I could return to him and he would 'find a roof for your head and timber for your belly' until something turned up.

"I returned, slept on the office floor and at 6 o'clock next morning was sent up a mountain trail to fetch a grey horse, Jack, with a cow-bell on its neck which would help me to find it. I found the horse, brought it down and after feeding began hauling logs to the tunnel. Next day I was put on shingling a roof—light work but roasting to a tender-foot unused to a strong sun.

"Later I was made clerk and time-keeper and in six months the Colonel was called home and I was left with power of attorney, bank, etc., and told gradually to pay off the miners and other workmen—about 40 all told—and to wait instructions from England.

"I was allowed to draw 44 dollars a month and the cost of my board from the money at my command and in two years I had saved enough to make me think about my future as there was no sign of work at the tunnel being resumed. During the summer I remained at the tunnel and in the winter I went to Denver where I spent my days in the office of a firm of lawyers (Sayer, Wright and Butler) reading Blackstone, Kent's Commentaries, Wheaton and other law books.

"In the mountains I made friends with many horsemen including Lin Sow, the superintendant of a Chinese Placer-Mining Coy., working in Clear Creek about 600 yards from my cottage. Lin Sow was a very intelligent man, speaking English fluently: his talk was highly interesting. In the evenings I

(*Concluded at foot of page overleaf*)

Current Literature

ABSTRACTS

The Use of the Plaque Technique for the Study of Porcine Enteroviruses. SINGH, K. V., BOHL, E. H., & BIRKELAND, J. M. (1959). *Amer. J. vet. Res.* **20.** 568.

It is well known that certain animal viruses are capable of producing plaques on monolayer cultures of mammalian cells grown *in vitro*. In many ways the use of this technique is comparable to the use of solid media for the cultivation of bacteria. The plaque technique has been used for the primary isolation of some viruses in order to separate mixtures of viruses, for neutralisation tests, and in a variety of other ways.

Singh, Bohl, and Birkeland, used the technique for the study of some porcine enteroviruses. They grew monolayer cultures of porcine kidney cells in 4-oz. prescription bottles using a growth medium containing 0.5 per cent. lactalbumin hydrolysate, 5.0 per cent. bovine serum, and 94.5 per cent. Hanks' balanced salt solution, together with antibiotics. When confluent healthy sheets of cells had been obtained, after 6 or 7 days' incubation, 0.2 ml. of virus inoculum was added to each bottle and dispersed over the cell monolayer. The inoculated bottles were incubated at 37° C. for 1 hour to allow for adsorption of the virus and then the monolayers were overlaid with agar. The agar overlay contained bovine serum, neutral red, lactalbumin hydrolysate, and antibiotics. Subsequently, the bottles were inverted and incubated at 37° C.

The authors were able to isolate enteroviruses directly from faecal suspensions. Recovery of a virus from an individual plaque was made by transferring with a capillary pipette a small amount of the plaque material to tissue culture tubes. In this way pure lines of virus were obtained. It was found that viruses isolated from the faeces of pigs varied in the characters and types of plaques they produced. The incubation period necessary for the first appearance of the plaque was as short as 24 hours in some cases, but as long as 7 days in others. Some agents produced large, rapidly-expanding plaques, while others produced smaller plaques which extended much more slowly. The plaques produced by some viruses had more clearly defined borders than others. The authors demonstrated that the plaque technique could be used for the titration of these viruses and for cross neutralisation tests. It is not clear from the paper how many immunologically distinct types of virus were isolated.

The authors also mentioned briefly that the virus of Aujesky's disease (pseudorabies virus) and the virus of infectious canine hepatitis produced plaques on porcine kidney cells but that the virus of transmissible gastro-enteritis failed to do so. A. O. B.

Genital Vibriosis in the Bovine—An Experimental Study on the Influence on Early Embryonic Mortality. ADLER, H. C. (1959). *Acta vet. scand.* **1.** 1.

It is generally believed that *Vibrio fetus* causes embryonic death but up till now experimental evidence that this is the case does not appear to have been published. Twenty virgin heifers were infected with *V. fetus* at the same time as they were inseminated. Ten were slaughtered after 14 to 15 days; in 9 of them an embryo was discovered, 4 of these in a degenerating condition. The other 10 heifers all came on heat, in 7 cases after a fairly normal interval. These were re-inseminated and slaughtered 14 to 15 days after the 2nd insemination. In 8 of these 10 heifers embryos were recovered, only 3, however, appearing to be normal. It thus appears that *V.*

"Go West Young Man."—*Concluded.*

used to go with him to the Chinese camp to see his miners at play, asleep on their shelves, or smoking opium.

The Start of my Professional Life

"In 1873, as an operator, unqualified in every sense of that word, I performed my first operation and my patient was the old grey horse, Jack. A large growth under the tail seemed to trouble him and I decided to remove it. I had never seen a horse cast for operation and I knew nothing about drugs or anaesthetics. I put this horse down by a method which, as it is never likely to be repeated need not be described. I excised the growth, the wound bled profusely and I checked with a steel drill heated in a stove.

"For a time, the horse showed some improvement but as the growth soon grew again and caused much irritation I shot the horse with a revolver. If I had known as much then as I know now about melanosis in grey horses I should not have meddled with this growth in Jack.

"Shortly after this event when reading 'The American Agriculturist,' a weekly that devoted a page to veterinary matters, I came across the name of one Noah Cressey, M.D., Professor at the Veterinary College, Amherst, Massachussetts. I wrote to him about my desire to qualify as a V.S. and he gave me every encouragement. Then I noticed the name of James Law, M.R.C.V.S., Cornell University, Ithaca, New York, and I also wrote to him and he strongly advised me to return home and obtain a British diploma.

"In the Autumn of 1875 I returned home and entered as a student at the Glasgow Veterinary College. I gained the diploma of M.R.C.V.S. in April, 1877 and was registered as from Gilpin County, Colorado. I fully intended to return to Denver but Principal McCall induced me to remain for a year or two as his Assistant at £1 per week and sleeping quarters but to provide my own fodder. For eleven years I remained at Glasgow Veterinary College and I owe much to McCall and his extensive mixed practice."

fetus causes death of the 2- to 3-week-old embryo. It was observed that the most common site of infection was the cervix and it is suggested that cervical infection is related to the embryonic death.

H. B.

Promazine Hydrochloride in Equine Practice. GORMAN, T. N. (1959). *J. Amer. vet. med. Ass.* **134.** 464.

In this paper the results are reported of a study of 100 equine cases in which promazine hydrochloride ("Sparine") was used to assist restraint. The drug was given prior to clinical and surgical procedures performed on the standing or recumbent animal, together with local or general anaesthesia when required. Many operations could be carried out on the standing horse which normally would have required general anaesthesia, and, where the latter was necessary, the dose required of the chloral hydrate-barbiturate anaesthetic agent used was greatly reduced; also, recovery was smooth and rapid. The operations performed included firing, neurectomy, castration, dental and eye surgery, and ovariectomy; examination of the penis was greatly facilitated by the relaxation of this organ produced by the promazine.

The promazine was given intravenously in most cases. Intramuscular administration was less reliable and less potent. The average dose required was 200 to 300 mg. for a 1,000-lb. horse, given in less than 10 ml. The tranquillisation commenced in 5 to 10 minutes, being maximal at 1 hour and having a residual effect for 24 hours. The dosage required varied with individuals and some horses appeared refractory, while 1 showed an idiosyncrasy with cardio-vascular side-effects. In this survey, the tranquillisation produced was satisfactory in 72 per cent. of the horses to which promazine was given, and it appears that it is a useful drug to use before examinations of nervous or vicious horses, or as a premedicant for surgical operations.

U. L.

Relation of Rabbit Gut Reaction to Enteropathogenic *Escherichia coli*. TAYLOR, JOAN, WILKINS, M. PATRICIA, & PAYNE, J. M. (1961). *Brit. J. exp. Path.* **42.** 43.

Strains of *Escherichia coli* were injected into ligated loops of rabbit intestine to determine their ability to cause dilatation. Those that had caused diarrhoea in babies produced dilatation but not those that had caused human urinary infections nor those that had been isolated from healthy babies or well water. From this the authors consider the dilatation test, as far as human strains are concerned, to be an indicator of enteropathogenicity rather than of general pathogenicity.

There was very little correlation between a positive test and an aetiological rôle in animal diarrhoeas. Only 3 of 8 strains of *E. coli* isolated from calf scours caused dilatation and none of 5 strains from swine enteritis and none of 4 strains from swine oedema.

H. W. S.

The Effect of Selected Insecticides on Growth and Egg Production when Administered Continuously in the Feed. ROSS, E., & SHERMAN, M. (1960). *Poult. Sci.* **39.** 1,203.

A number of workers have recently investigated the possibility of continuously feeding insecticides to poultry in order to control the development of the larvae of house flies (*Musca domestica*) in the droppings.

In the present study 7 products were fed to laying battery hens and growing chicks for 29 weeks. Some were toxic—their effect being greater in the chicks than in the hens, others gave subclinical toxicity shown by lowered bodyweight and depressed egg yield. Two appeared to show little toxicity either to hens or to chicks.

The authors suggest that further studies should be made to evaluate the long-term effect of such drugs and to investigate the presence of residual insecticide in the poultry meat, organs, and eggs.

E. A. G.

Hepatic and Subphrenic Abscesses in Cattle with Rupture into Vena Cava Caudalis. RUBARTH, S. (1960). *Acta vet. scand.* **1.** 363.

In 25 years 1,279 mature cattle have undergone autoptic examination in the Department of Pathology, Royal Veterinary College, Stockholm. In 56 (4.4 per cent.) of these cases abscesses had ruptured into the vena cava caudalis. The abscesses were hepatic or subphrenic in 53 cases, thoracic in 2 cases, and retropharyngeal in 1 case. To observe this lesion the *post-mortem* examination must be carried out very carefully. "Blackcurrant jelly" clots of extremely well coagulated and nearly black blood are found in the heart and large veins. The characteristic autopsy findings were emphysema, haemorrhages, and oedema, in the lungs; haemorrhages in the respiratory passages; and subendocardial and subepicardial petechiae. Although comparatively common, the condition is very rarely recognised clinically. None of the 56 cases was seen by a veterinary surgeon before death. In 51 cases the animals were found dead, some with red-coloured, frothy fluid around the nostrils and in no case was death throes reported. Two bulls and 1 cow died immediately after service. Samples from other cases have been received in which there was prolonged depression and metastatic pneumonia. The reason why death is so sudden is unknown but the author suggests that the animal has become sensitised to the abscess contents and when these are suddenly discharged into the blood-stream there is an allergic shock. *Post-mortem* examination of these cases is often not carried out because the symptoms suggest anthrax. In this connexion the author mentions that only 5 per cent. of all blood samples submitted to the State Veterinary Medical Institute for anthrax examination were positive. At the Veterinary College, of 713 mature cattle undergoing autopsy with a history of sudden death, the most common cause of death was tympany, followed by sepsis, clostridiosis, and, fourthly, the purulent vascular erosion described here.

H. B.

Divisional News

SOME PROFESSIONAL PROBLEMS *

A thing that has impressed me during my year of office, is the value to each of us, as individuals, of joining the B.V.A. The progress and unity of the profession can only be maintained, planned and guided by free discussion in Divisions, co-ordinated through the B.V.A. The area covered by this Division is a large one, and the introduction of discussion groups within it will serve to keep members in professional and social touch, with the advantages that implies.

We were all pleased to learn of the award of the O.B.E. in the New Year Honours List to Mr. T. H. Jones, and also of the election of Mr. A. G. Beynon as President-elect of the British Veterinary Association. The Division is rightly proud of the honours bestowed on these two members, who have done so much for the Division and the profession. I feel sure we shall give evidence of our support to Mr. Beynon at the Scarborough Congress in 1962.

This is the one privileged occasion when a member can express his views without fear of comment or discussion in committee; and the main theme of what I have to say will be in relation to practitioners. Having been qualified nearly 14 years, and having spent that time wholly in general practice, one of the striking things that has appeared to me during this time is the unrelenting pressure brought to bear on the practitioner in relation to earning his daily bread. Freely available advice is given to clients by so-called technical officers employed by feeding-stuff manufacturers, drug houses and even the government itself. My impression has been that as long as farmers have to employ us on the fee per case basis, they will continue to avoid calling us in, and will seize the opportunity to get something for nothing. I have no doubt that we do a very good job and give of our best, but I do feel that the profession, through the B.V.A., should get down to this fundamental problem. Disease to-day must be controlled on a herd or flock basis, and to do this the practitioner wants freer and easier access to the farm. I believe this situation to be serious. As one of my colleagues in this Division pointed out, we are dependent on a heavily subsidised industry. It will be very difficult for the Association to go into any long-term policy with the N.F.U. The alternative is that we may wake up one morning and find ourselves nationalised. I myself would prefer, if this should ever happen, that it was done by the profession and controlled by the profession, while preserving the individuality and independence of the practitioner.

The welfare societies are still a thorn in our side. They can advertise, and seem to have endless capital to carry on their work. We have not the advantage of these things and we have to get along with our unaided skill and service, and by these means keep our heads above water. The public seem to me to advertise our mistakes much quicker than our successes; and I believe the best solution is not to run these societies down but to get inside. This will become more possible in the near future thanks to the effects of the Association's officers in the past decade. I am hopeful that the next decade will be a big improvement on the last one. In this connexion, I believe that the mobile clinic serves very little purpose and should be abolished; it cannot provide anything resembling an adequate service.

Specialisation and Drugs

The age of specialisation is here and in my opinion will manifest itself more and more in the years to come. As one farmer in Llanelly told a late member of this Division—" it amazes me that the veterinary surgeon's head can carry so much "; but this is becoming less applicable to the profession. I don't care whether veterinary investigation laboratories are run by the universities or the state, but I think they should not be 80 to 100 miles away from a veterinary practice. They should be within one hour's journey so that their services can be utilised to the full. I believe the day is past when a practitioner can open a carcase and make a positive diagnosis. Intensive stock keeping and rearing, together with the increased value of livestock demand accurate diagnosis, and this should be within the day-to-day scope of every practice if mistakes are to be avoided. The veterinary surgeon of to-day is not allowed to *think* a condition is so and so—he must *know* it is this or that.

A word about drugs. To-day, the practitioner has an endless variety of " mycins," steroids and pyridines pushed at him. Nothing is ever heard of therapeutic ratio or of undesirable side effects. Rarely is any clinical trial with controls presented to us. I think it is up to us to refuse many of these drugs until we are satisfied of their efficiency, and here I think the veterinary schools could, and should, play an important part in providing us with the truth.

New Graduates

My chief concern for the future is the reluctance of young graduates to enter practice. We are told this will correct itself but I doubt it very much. I don't think it is a problem of numbers but one of security and finance. I don't know that I blame the young graduates, for the pleasure seems to have gone out of general practice. The rising cost of all essentials and the reluctance of the agricultural population to meet our fees makes for a profession of hard-headed businessmen, and this, to my mind, is wrong. Whilst on the subject of new graduates, there seems to have been a deterioration in their practical knowledge in recent years. It is probably not the new graduates' fault but seems to arise as a sequel to the 1948 act. I think it could be partly remedied by a much closer liaison between the veterinary schools and the extramural tutors. In this liaison, the practitioner could keep the university school informed of the changing conditions in the

* Presidential address to the South Wales Division, delivered by Mr. D. G. Llewellyn.

field, and the teachers could advise the practitioners how best to tackle the problem of extramural tuition.

The graduate of to-day is leaving the university with an infinitely wider basic scientific training than his predecessor. He has untold opportunities of success in our profession, and if he can apply in the field the knowledge he has gained at the university and gradually add to it by his own careful observations, I am sure his future is assured. As for the form this future will take—who knows?

THE SOUTHERN COUNTIES VETERINARY SOCIETY

A meeting was held with the Society of Practising Veterinary Surgeons on Wednesday, February 22nd, 1961, at the Red Lion Hotel, Salisbury. Thirty-one members and 27 visitors and members of the Society of Practising Veterinary Surgeons were present. Apologies for absence were received from 5 members.

The meeting was preceded by a business meeting of the Society of Practising Veterinary Surgeons.

Swine Fever Vaccination Scheme

Members were informed that the Wiltshire N.F.U. had that day agreed to the 28-day period and the 5s. fee. They were reminded to contact B.V.A. Headquarters for their numbers by the middle of March, since the first pigs were expected in the market at the beginning of May. In Wiltshire metal Ketchum tags were being used.

Economics Committee Report

Mr. W. E. Harrison then addressed the meeting on "Costs, Prices and Profits." Referring to the report of the Economics Committee of the S.P.V.S., he thought costing valueless unless action were taken. The aim of the average veterinary surgeon should be first and foremost to earn a living and make a profit; rendering a service should be the means to the end. He felt that the report did not go far enough in varying the charge according to the professional skill, etc., required to do the job, but a start had to be made somewhere. The basis of the report was as follows:—

(1) Drugs were to be charged at list price with a reasonable dispensing fee if necessary.

(2) Profit should be made mainly on professional skill.

For this reason the cost of transporting the body from one place to another was charged at a cheaper rate than skilled work. Of course, further modifications could be made grading the degrees of skill and charging for them, but the costs could be taken to mean the *average costs* for the *average skilled work*.

The method of cost accounting was explained in the report. The principal in the practice was, he thought, justified in having twice the salary of the average assistant, since he was also the manager of the practice and should receive a salary for this. Sooner or later he would retire and would need superannuation benefits. He also provided the capital, as anyone buying a practice would know to his cost, and the goodwill, an intangible asset, but an asset as anyone who set up his plate would know by his reduced earning for the first few years. A profit should also be made.

Final accounting should not take longer than 1 day each year. The heads were present in the report. From this it was simple to work out what it cost per hour to run the practice, provided one kept an accurate log book for, say 1 different day each week throughout the year. A column analysis book was necessary. Each quarter costing should be checked.

Uniform charging was frowned upon, so no price should be recommended by the S.P.V.S., but they could recommend a fair average time for a job, and the fair average cost of a job. The profit should be adequate to cover cut fees, free work, losses, and research. In his opinion a 10 per cent. profit on turnover was reasonable. A good manager should also make a profit on travelling time, but a standard fee was necessary here since there would be complaints if the mileage varied.

In the discussion he recommended tax avoidance but not tax evasion. He recommended that the S.P.V.S. should consider employing a consultant tax accountant and that the advantages and disadvantages of limited liability companies should be investigated.

For comparison, salaries for a senior qualified assistant accountant were £20 to £25 per day for fewer days of the year and for fewer hours of the day. Bad debts should be shown in the overheads.

The skill of the more experienced veterinary surgeon was discussed, the more skilful the more in demand *versus* the more skilful the fewer workable hours each year—this obviously depended on the individual. Unlike manufacturers, veterinary surgeons had to do all the work asked of them, but that was no reason why it should not be charged for. One might think it good policy to lose on some jobs, but remember it. A member suggested that from the figures of the report he should be making a loss, but he was making a profit. Why the paradox? Mr. Harrison replied that if the charges on drugs were high one could not charge on time too; if that were not the answer perhaps if he had charged more he might be in an even better position to-day.

In the discussion a veterinary surgeon remarked that a third of his clients produced 80 per cent. of his income and also paid more promptly. Surely this was evidence of the value of the veterinary surgeon to the farmer.

Mr. J. B. White proposed a vote of thanks to Mr. Harrison for his excellent talk and handling of the questions. In reply, Mr. Harrison recommended the report as the basis of a costing scheme in every practice. If flaws were found in it the members should report them to the S.P.V.S. Council who would investigate the matter and if necessary find a better solution.

Notice of the next meeting of the S.P.V.S. was given.

THE DUMFRIES AND GALLOWAY DIVISION

A general meeting was held in the Queensberry Arms Hotel, Annan, on Wednesday, February 1st, 1961. The President, Mr. R. L. Bell, took the chair. Fourteen members and 5 visitors signed the atten-

dance book; apologies for absence were received from 7 members.

Minutes

The minutes of the meeting held on November 9th, 1960, were read and approved.

Matters Arising

The secretary reported that he had received a reply from the Area Agricultural Adviser, B.O.C.M., saying that while he would be pleased to see the Division at South Cathkin on the proposed date, Wednesday, June 28th, this was, in fact, not the best time of year to see the work being carried out at South Cathkin. Mr. Goldie, being present, amplified these remarks and suggested alternative dates for the visit. It was agreed that the Executive Committee should reconsider this matter in the light of Mr. Goldie's comments and suggestions.

Correspondence

A letter was read from Mrs. Fleming reporting that as a result of the dinner-dance held in the Cairndale Hotel a cheque for £96 18s. 8d. had been sent to the V.V.B.F.

A letter was read from the General Secretary of the B.V.A. on the subject of the Cheshire Scheme for Certified Crystal Violet Vaccination of pigs.

A letter was read from the B.V.A. on the subject of Meat Inspection Refresher Courses. Three members indicated that they were interested in such a course and the secretary was instructed to approach Mr. H. Thornton, of Newcastle upon Tyne and also to explore the possibility of joint action with the Lakeland Division.

Film Show

Mr. J. M. Goldie, representing B.O.C.M., then presented 2 films: "Quality Milk" and "Winter Milk Production." Afterwards Professor J. S. S. Inglis and Dr. R. G. Hemingway of the Department of Animal Husbandry and Veterinary Preventive Medicine, Glasgow Veterinary Hospital, commented on these films and enlarged upon several of the points brought out in the films. They answered many questions put to them by members.

MID-WEST VETERINARY ASSOCIATION

A meeting was held at the Grand Spa Hotel, Clifton, Bristol, on March 17th, 1961, at 7.45 p.m. The President, Mr. J. Cameron, was in the Chair. Sixty-five members and visitors were present.

The President announced that it was hoped to hold a further meeting of the Division in April, and, therefore, with members' consent, he would like to propose that the meeting be considered a special meeting and the business dealt with in April. The meeting agreed to the President's suggestion.

Paper by Mr. E. Straiton

Mr. E. Straiton then gave a paper entitled "Practice Organisation and a Look into the Future." He spoke on what he considered to be the proper way to run a happy practice, personal fitness and freedom from financial worry being just 2 of the essential elements, plus a control where wives were released from answering the telephone. The second part of his paper was devoted to showing how he was tackling the problem of financial worry, and how, if this financial problem were overcome, his practice could again make progress. If this were not done he felt that his practice, like many others up and down the country, might become static.

Mr. Straiton then showed his film on parturition.

Mr. T. K. Stephens opened the discussion, in which members present took part at length.

Other Business

The President read a letter from the Southern Counties Division inviting the Division to a joint meeting at Salisbury on April 26th, 1961; it was felt that, in view of the fact that they were already holding a meeting on April 10th, the invitation could not be accepted.

News and Comment

BROILER RABBITS

The broiler rabbit industry has arrived, and like all rapidly expanding businesses it is bound to have teething troubles. One breeder proudly asserts that disease losses are negligible, but others have already met health problems. It is up to the veterinary profession to keep abreast of the industry and, if possible, anticipate the questions that will be raised.

The B.V.A. with this end in view is collecting data on management, housing and nutrition as well as on diagnosis and treatment of disease. It is hoped there will be a two-way flow, information coming into the B.V.A. office from those already experienced, and help going out to those who are called on to solve these problems. Those interested in either aspect are asked to contact B.V.A. headquarters at once.

PATHOLOGICAL SPECIMENS SENT BY POST

We are indebted to our university correspondent at Cambridge for drawing our attention to the requirements of the postal authorities so far as pathological specimens are concerned. As such specimens are sent by many members of the profession to Veterinary Investigation Centres, Schools, and Research Institutes it may be useful to give a résumé of the appropriate regulations.

In principle, pathological specimens are regarded as "deleterious substances" and are prohibited from postal transmission under the Post Office Act of 1953. For many years, however, a relaxation has been allowed so long as specimens are sent by letter post, and the strongest packing requirements, as laid down in the Post Office Guide, are followed. The following notes, provided by the postal authorities, are relevant:—

Any such liquid or substance must be enclosed in a receptacle, hermetically sealed or otherwise securely closed, and this receptacle must itself be placed in a strong wooden or metal case (or other case which has been approved by the Post Office) in such a

way that it cannot shift about, and with a sufficient quantity of some absorbent material (such as sawdust or cotton wool) so packed about the receptacle as absolutely to prevent any possible leakage from the package in the event of damage to the receptacle. The packet so made up must be conspicuously marked fragile with care and bear the words pathological specimen.

Any packet of the kind found in the parcel post, or found in the letter post not packed and marked as directed, will be at once stopped and destroyed with all its wrappings and enclosures. Further, any person who sends by post a deleterious liquid or substance for medical examination or analysis otherwise than as provided by these regulations is liable to prosecution.

If receptacles are supplied by a laboratory or institute, they should be submitted to the Post Services Department (H.M.B.) Headquarters Building, General Post Office, St. Martin's-le-Grand, London, E.C.1, in order to ascertain whether they are regarded as complying with the regulations.

MR. ROBERT COULTHARD

G. C. writes:—

The death of Robert (Roy) Coulthard marks the end of an era in the veterinary service of Northern Nigeria. The last serving officer in an older tradition, he represented a way of life which few will know again.

His love of living was matched by a meticulous efficiency in the conduct of his affairs. Although for him the Harmattan has drawn its final veil over the face of Africa, his footsteps will not soon be erased in the sands of time.

He was denied the eventual retirement he was planning, and which he would have known so well how to enjoy, but there are many whose lives are richer for having known him.

UNIVERSITY NEWS

Edinburgh

A correspondent writes: The annual One Day event of the Royal (Dick) School Horse Society took place at Bush House, Milton Bridge, Midlothian, on May 13th. The weather conditions were perfect and the lawns and park of Bush House were looking their best. Much of the success of this event is due to its situation and the committee wish to express their thanks to the Edinburgh Centre of Rural Economy for their kindness and boundless co-operation over the last few years.

At its inception, this event was a gymkhana for students of the School, but it has evolved into an official British Horse Society One Day event over a period of six years. It is considered that this year's event was the most successful to date.

Of the original 29 entries, there were 27 starters including 3 students from the "Dick." The competition was most exciting in the closing stages and the general standard of the competitors was high. The winner was Miss C. Graham Menzies on "Gambler." by the narrowest of margins (0.2 penalty points) from Miss M. H. A. Rose's "Yum-Yum." It is sad for the mere male to reflect that ladies filled the first 8 positions in the final placing. Any readers who wish to learn more of the event may like to refer to *Horse and Hound* dated May 27th.

The organising committee wish to thank all those members of staff and students who helped, in a variety of ways, to run this event. Particular thanks are due to the Hon. M. E. Joicey, the area B.H.S. representative for his wise guidance and counsel and to Mr. W. W. Thomsen who came down from the rarified atmosphere of the B.H.S. in London to grace the event.

London

A correspondent writes: The 169th Annual Ball of the Royal Veterinary College was held at the Park Lane Hotel, on May 26th.

Dinner was followed by an amusing and eloquent speech by our guest of honour, Mr. Dorian Williams, M.F.H. One of the more serious points he made was that we, in our chosen career, should be aware of the state of ignorance of the general public with respect to the care and management of animals and thus be prepared to "educate" them. He referred to instances where misguided kindness can often lead to suffering.

We were pleased to welcome among our many guests The Principal of the College, the President of the B.V.A., the vice-Principal, and representatives of all the other veterinary colleges. The Hunting Horn competition was won for the third successive year by Mr. Andrew Spurrell.

PERSONAL

Mr. J. A. Dixon who joined Leeds Corporation as a veterinary inspector in 1905 has been elected a life vice-president of the Royal Society of Health. He has been a member of the Council for 30 years and is the first holder of a life vice-presidency.

Dr. M. S. Reichert, M.B.E., and his wife were among the guests at the Royal Garden Party at Buckingham Palace on May 11th.

Mr. Peter Ellis and family arrived in England this week from Rio de Janeiro, Brazil, on finishing a term of appointment of 9 years with the Pan American Foot-and-Mouth Disease Centre. As Chief of Field Services of the Centre, Mr. Ellis was well known throughout Latin America, all the countries of which he had visited many times in the course of his duties. He had, recently, been intimately associated with the planning of programmes for the control of foot-and mouth disease in Ecuador, in the frontier region of Colombia and Venezuela and in Argentina. The new attack on the disease now being made in Argentina with an initial budget equivalent to £2 million is regarded by the Pan American Centre as being of such importance that Mr. Ellis was assigned to Buenos Aires from January to the end of April of this year to provide assistance in the initiation of the campaign.

Engagement

RICHMOND—LIVINGSTON.—The engagement is announced between Brian Tyrrell, son of Mr. and Mrs. R. M. Richmond, of Kelloe, Whyteleafe Road, Caterham, and Jill Campbell, daughter of the late Dr. J. C. Livingston and Mrs. Jean Barrington, of the Spread Eagle Hotel, Thame.

COMING EVENTS

June

7th (Wed.). SOUTH WALES DIVISION. General Meeting at the Langland Bay Hotel, Mumbles, Swansea, 2.15 p.m.

B.S.A.V.A. NORTH EASTERN REGION. Meeting at the Hotel Metropole, King Street, Leeds, 8 p.m.

SCOTTISH BRANCH. Annual General Meeting at the Royal (Dick) School of Veterinary Studies, 5 p.m.

8th (Thurs.). SCOTTISH METROPOLITAN DIVISION. Summer Meeting in the Golden Lion Hotel, Stirling, 2.30 p.m.

WORCESTERSHIRE CLINICAL CLUB. Meeting at the Farmers' Club, Broad Street, Worcester, 2.45 p.m.

9th (Fri.). R.A.V.C. OFFICERS' CLUB. Annual Dinner at the Naval and Military Club, 94 Piccadilly, W.1.

10th (Sat.). R.V.C. 1952 Club's Annual Reunion. Dinner at "Ye Miller of Mansfield," Goring-on-Thames.

14th (Wed.). WEST OF SCOTLAND DIVISION. Meeting of the Clinical Club at the University Veterinary Hospital, Bearsden, 7.30 p.m.

17th (Sat.). B.S.A.V.A. NORTH-WEST REGION. Meeting at the Queen Hotel, Chester, 7.30 p.m.

22nd (Thurs.). ASSOCIATION OF VETERINARY FOOD HYGIENISTS. Meeting at Forfar, Angus (to visit the new slaughterhouse). Members should assemble at the Municipal Buildings, Castle Street, 2.30 p.m.

September

2nd (Sat.). STREATLEY '58 CLUB REUNION. Annual Dinner at "Ye Miller of Mansfield."

3rd to 9th (Sun. to Sat.). 79th Annual Congress and Exhibitions of the British Veterinary Association at Oxford

7th (Thurs.). ROYAL VETERINARY COLLEGE ASSOCIATION. Annual Dinner during the B.V.A. Congress at St. Edmund's Hall, Oxford.

ADDRESSES OF DISEASE INFECTED PREMISES

The list given below indicates, first the date on which disease has been confirmed, followed by the postal address and local authority.

Anthrax

May 23rd, 1961. W. McLanachan, Logan Hill Farm, Cumnock, Ayrshire (Parish Cumnock) (Cattle). AYRSHIRE.

May 29th, 1961. J. J. P. Tyson, Rough House, Asby, Workington. Cumberland (Parish Arlecdon) (Cattle). CUMBERLAND.

Fowl Pest

May 24th, 1961. J. W. Sharples, 40, Smallholdings, Knuzden, Blackburn, Lancs. LANCASHIRE.

May 24th, 1961. D. Parkinson, Whitecroft, Woodplumpton, Preston, Lancs. LANCASHIRE.

May 24th, 1961. C. Cross, Highfield Farm, Lea, Preston, Lancs. LANCASHIRE.

May 24th, 1961. A. Holden, Beech House, Duck Street, Pilling, Preston, Lancs. LANCASHIRE.

May 25th, 1961. G. Grimbalderston, Blackbeach Farm, Catforth, Preston, Lancs. LANCASHIRE.

May 25th, 1961. H. Cowburn, Higher Stanworth Farm, Withnell, Chorley, Lancs. LANCASHIRE.

May 26th, 1961. J. Burnett, Westfield House, Osmandthorpe, Leeds, Yorks. CITY OF LEEDS.

May 26th, 1961. Haven Turkey Farms Ltd., The Haven, Selsdon Vale, Selsdon, South Croydon, Surrey. SURREY.

May 26th, 1961. Mrs. A. E. Rokeby, The Rectory, Mundford, Thetford, Norfolk. NORFOLK.

May 26th, 1961. Miss E. M. Shepherd, Woodville, Brockhill, Wickford, Essex. ESSEX.

May 28th, 1961. C. Fabris, 204, Harrow Lane, St. Leonards-on-Sea, Sussex. EAST SUSSEX.

May 29th, 1961. E. J. Lambert, Rose Marie, Gardiners Lane, Crays Hill, Billericay, Essex. ESSEX.

Swine Fever

May 23rd, 1961. E. Lockley, 21, Caer Road, Oswestry, Salop. Disease at: Shelf Bank, Oswestry, Salop. SHROPSHIRE.

May 23rd, 1961. F. G. Parrott, Beech Farm, Beech, Trentham, Stoke-on-Trent, Staffs. STAFFORDSHIRE.

May 23rd, 1961. F. G. Parrott, Beech Farm, Beech, Trentham, Stoke-on-Trent, Staffs. Disease at: Aston Hall Farm, Stone, Staffs. STAFFORDSHIRE.

May 23rd, 1961. J. Macnamara, 32, Parliament Street, Upholland, Wigan, Lancs. LANCASHIRE.

May 23rd, 1961. G. Carey, Hill House Farm, Preston, Lavenham, Sudbury, Suffolk. WEST SUFFOLK.

May 23rd, 1961. H. Jones, Field House, Cliffe, Selby, Yorks. YORK, EAST RIDING.

May 23rd, F. G. S. McAlpine and Sons, Ryslaw, Duns, Berwickshire. BERWICKSHIRE.

May 24th, 1961. G. Sisterson, 24, Whitley Street, North Shields, Northumberland. Disease at: Piggery, Tanners Bank, North Shields. COUNTY BOROUGH OF TYNEMOUTH.

May 26th, 1961. R. C. Abel, Roskil Farm, Snape, Bedale, Yorks. Disease at: Lawns Farm, Snape, Bedale, Yorks. YORK, NORTH RIDING.

May 26th, 1961. R. C. Abel, Roskil Farm, Snape, Bedale, Yorks. YORK, NORTH RIDING.

May 26th, 1961. T. Wilkinson, Russell House, Park Lane, Preesall, Fleetwood, Lancs. Disease at: Gravel Quarry, Sandy Lane, Preesall, Fleetwood, Lancs. LANCASHIRE.

May 26th, 1961. T. Wilkinson, Russell House, Park Lane, Preesall, Fleetwood, Lancs. LANCASHIRE.

May 26th, 1961. T. W. Southern, Hunters Farm, Carr Lane, Much Hoole, Preston, Lancs. LANCASHIRE.

May 26th, 1961. Beverley Bracey, Manor Farm, Stalham, Norwich, Norfolk, NOR. 342. Disease at: Piggeries at Oakland Farm, Strumpshaw, Norwich, Norfolk. NORFOLK.

May 29th, 1961. W. H. Merrin, Brenk House Farm, Nether Silton, Thirste, Yorks. YORK, NORTH RIDING.

May 29th, 1961. K. M. Wood, Old Thorns Farm, Liphook, Hants. HAMPSHIRE.

May 29th, 1961. R. Dyer, 54, Baunton Village, Cirencester, Glos. GLOUCESTERSHIRE.

May 29th, 1961. S. N. Hadingham, Whitehouse, Stradbroke, Diss, Norfolk. EAST SUFFOLK.

May 29th, 1961. R. W. D. Skene, Pitlour, Strathmiglo, Fife, Fifeshire. Disease at: West Bank Farm, Strathmiglo, Fife. FIFESHIRE.

May 29th, 1961. F. Challis, 2, Kirk Street, Stillington, Stockton-on-Tees, Co. Durham. Disease at: South Street Piggeries, Stillington, Co. Durham. COUNTY DURHAM.

May 29th, 1961. Messrs. E. & J. Grant, Dewley Farm, Throckley, Newcastle upon Tyne, 5. NORTHUMBERLAND.

Letters to the Editor

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the B.V.A.

R.C.V.S. Day

Sir,—The Royal College of Veterinary Surgeons is entitled by Royal Charter to hold its Annual General Meeting in the capital cities of London, Edinburgh and Dublin. This year, for the second time since the war, the Annual General Meeting is to be held in Edinburgh.

In accordance with the practice of recent years, there will be a corporate service and commemoration of benefactors of the College. This will be in the High Kirk of Edinburgh, St. Giles' Cathedral, at 11.30 a.m. Following the service, the Annual Luncheon is to be in the Adam Rooms of the George Hotel at 12.30 for 1 p.m., and the Annual General Meeting is in the Royal (Dick) School of Veterinary Studies at 3.30 p.m. This will be followed by tea.

I am particularly pleased that the College Council arranged for Royal College Day to be held in Edinburgh in the second year of my presidency and it is as President that I am writing this note to invite the support of members of the profession and their families at any or all of the functions of this day.

I look forward to meeting many old friends.

Yours faithfully,

J. N. RITCHIE,
President.

Royal College of Veterinary Surgeons,
College House, 29/31 Wright's Lane,
Kensington, London, W.8.
May 29th, 1961.

Promazine Hydrochloride as a Tranquilliser for Sows

Sir,—The following experience may be of interest to your readers. The subject was a Landrace-cross gilt 1 year old. She commenced to farrow at 11 a.m. on the due date but kept rising, walking around the loose-box, and savaging the piglets when they were born. By 2.30 p.m. she had farrowed 6, had killed 1, badly injured 2, and attempted to kill the other 3 which were rescued by the owner. The gilt was not savage to the attendant or to the veterinary surgeon.

Treatment consisted of 4 ml. (200 mg.) promazine hydrochloride (Sparine) injected into the ischio-rectal fossa, followed by 3 ml. posterior pituitary extract injected similarly.

The gilt lay down 10 minutes later and farrowed 6 piglets allowing them to suckle. She remained placid and reared in all, 9 piglets. Several preparations have been tried in the treatment of savage sows, but this is the first time success has been achieved.

Yours faithfully,

Southwoods Hall, D. V. SINCLAIR.
Thirsk, Yorks.
April 29th, 1961.

A Case of Delayed Twinning ?

Sir,—I would be grateful for comment from your readers on the following phenomenon.

A 2½-year-old pedigree Aberdeen Angus heifer, "Primula," was running with the bull during March, 1960, and was seen to be served on March 25th. Shortly afterwards the bull was removed from the small group of heifers with which he had been running and these heifers were grazed in an enclosure to which no bull had access thereafter. On January 2nd, 1961, "Primula" was assisted to calve by the farm manager and a normal live Aberdeen Angus bull calf was delivered. In early April it was noticed that "Primula" was losing condition and it was decided to keep her in each night. On May 20th, 1961, the cattleman assisted her to calve a normal live Aberdeen Angus heifer calf.

It would appear difficult to explain this unusual occurrence on the basis of normal physiology, and two possible lines of thought occur. "Primula" may have exhibited oestrus on or about August 14th, 1960, when approximately 4½ months in calf, was mated unknown to the farm staff, and conceived, in which case a comparison may be made with a suspected case of superfoetation described by Williams (1943). A more attractive theory is that she conceived twins to the original service on March 25th, 1960, and that foetal development in one uterine horn was arrested.

If one favours the latter hypothesis may there be an analogy with the Roe deer in which, as is generally accepted by stalkers in this area, the fertilised ovum remains dormant for several months?

In any event the case of "Primula" is most provocative and the observations of my colleagues are eagerly anticipated.

Yours faithfully,

Duisdale, W. M. BARR.
Lochgilphead, Argyll.
May 25th, 1961.

Reference

WILLIAMS, W. L. (1943). "The Diseases of the Genital Organs of Domestic Animals." Baillière, Tindall & Cox, London.

The Future of the Profession

Sir,—I wish heartily to endorse the part of Mr. Hoddinott's letter of May 13th, which dealt with the question of the proposed raising of P.D.S.A. licensees to the Supplementary Register. Maybe he is a little premature in his assertions, but I feel that in our profession to-day it is better to be so rather than trying to shut the stable door once the horse has bolted.

In 1948 the profession accepted the creation of the Supplementary Register, not liking it, but as the thin edge of the wedge to protect our future. We did so, however, on the assurance that no further additions would be made to it. That would mean, as with the dentists, that as deaths and retirements took place, the Supplementary would gradually die out. Now, only 13 years after, we are faced with the demand that a further addition of P.D.S.A. licensees be made to it. What guarantee shall we be given

that a further demand of a similar nature will not be made again in the future? Additions to the Supplementary Register will mean that it will never be allowed to die out—to the benefit of the P.D.S.A. not the profession. I regret to say that it is completely beyond my comprenension how this proposed move will benefit the profession. Perhaps Sir Lawrence Watkinson could elucidate this in a letter to THE VETERINARY RECORD?

We in the profession may know very little about these licensees. Under whose supervision are they? What courses (if any), do they take? What examinations (if any) are they compelled to pass, and if so what body carries out the examinations? Whatever may be the answer to these queries I still maintain that all future additions to the profession must be limited to fully trained university graduates. To carry on this new proposal would, in my mind, eventually reduce the profession to the level of a semi-skilled trade.

What would be the opinion of the dental profession if it were suggested to bring in more "dentists"? Or the medical profession if it were suggested to raise nurses to the same level as doctors? Yet nurses have to undertake a prolonged course with examinations at the end. These measures would be identical to what, Sir, it is now proposed to do to the veterinary profession.

What is the point of sending a boy or girl to a university at considerable expense if, when he or she is qualified, the status attained is only that of an unqualified licensee raised to the level of the Supplementary Register?

I maintain that this question is of such importance to the profession that the R.C.V.S. or the B.V.A., should, through the medium of THE VETERINARY RECORD, hold a ballot on the matter, and abide by the majority vote.

We must not be complacent over this matter. We must realise that once a licensee is raised to the level of the Supplementary Register he is not limited to working for the P.D.S.A. He can open a practice in any part of the country.

Yours faithfully,

10 Booths Hill Road, A. M. EDWARDS.
Lymm.

May 23rd, 1961.

Defects in Beef Bulls

Sir,—I was most interested to read the letter by Mr. J. P. Pickering in your issue of May 20th.

It must be agreed that the bringing out of beef bulls for show and sale is an art which is not conducive to fertility. It also must be realised that if a breeder consigns a yearling bull to major sale in fit breeding condition he might receive £X but if he consigns the same bull to the same sale on "butter ball" condition he might receive £10X. The answer is surely obvious. On the one hand the breeder is to blame for producing bulls unfit for work and on the other hand the buyer is equally to blame for buying such a bull for immediate use. Many farmers now realise that it is often useless to expect much from a young bull in his first season and he is primarily bought for use the following season. At the same time it is extremely difficult for a farmer with X bred cows to obtain a suitable bull for immediate use due to the disparity in size.

Over-feeding may be one of the contributing factors involved in this problem but are we faced with another example of the misdirected efforts of the breeders as exemplified by the soup plate feet and cow hocks of the Clydesdale or the too straight hind legs of certain Friesian bulls, in breeding beef animals with more flesh, quicker maturing qualities and shorter legs until the stage has been reached that for a yearling bull to serve, the cow or heifer has to be sunk 1 to 2 feet in a hole. Many stackyards are dotted with holes of varying depths to accommodate their latest purchase. The breeders, due to their policy of breeding for quick maturity of fleshing have at the same time bred a sexually slow maturing bull with, more important, a disturbing lack of male virility. These characters are no doubt enhanced, as Mr. Pickering mentions, by the use over the years of sires of similar qualities only persuaded to work by careful coaxing and the utmost patience.

This problem was investigated at this laboratory in 1957-58 with a view to determining its incidence and a questionnaire was sent out to all purchasers of young beef bulls at 3 major sales in the College area.

The results are as follows:—

	1957	*1958*
Questionnaires sent out	299	370
Questionnaires returned	199	204
Bulls showing complete lack of libido when first used	30	22
Bulls were keen, showed libido but were unable to perform coitus	32	21
Complete inability to copulate during 1st year, *i.e.* no libido, couldn't mount, would not extrude the penis, etc. ...	13	12
Bulls serving but with very poor fertility	6	6
Sterile bulls, tested and/or slaughtered	7	8
Total	88	69

The performance of the bulls giving unsatisfactory results in their first year was reinvestigated in 1958-59, in their second season, and it was found that 88 per cent. and 92 per cent. were satisfactory.

It is likely that the majority of the questionnaires which were not returned referred to normal bulls and if this is assumed to be the case then 27 per cent. and 16 per cent. of the bulls were deficient in their first season (excluding sterile animals) but only 3.8 per cent. and 1.4 per cent. of bulls sold in 1957 and 1958 were either infertile or still completely unsatisfactory in their second season.

The remedy undoubtedly lies with the breeders and the buyers but until it is realised that their policy is wrong and even potentially dangerous, veterinary surgeons will still have to spend many a weary hour with an artificial vagina and a mounting frustration.

Yours faithfully,

D. W. DEAS.

The Edinburgh School of Agriculture,
West Mains Road,
Edinburgh, 9.

May 29th, 1961.